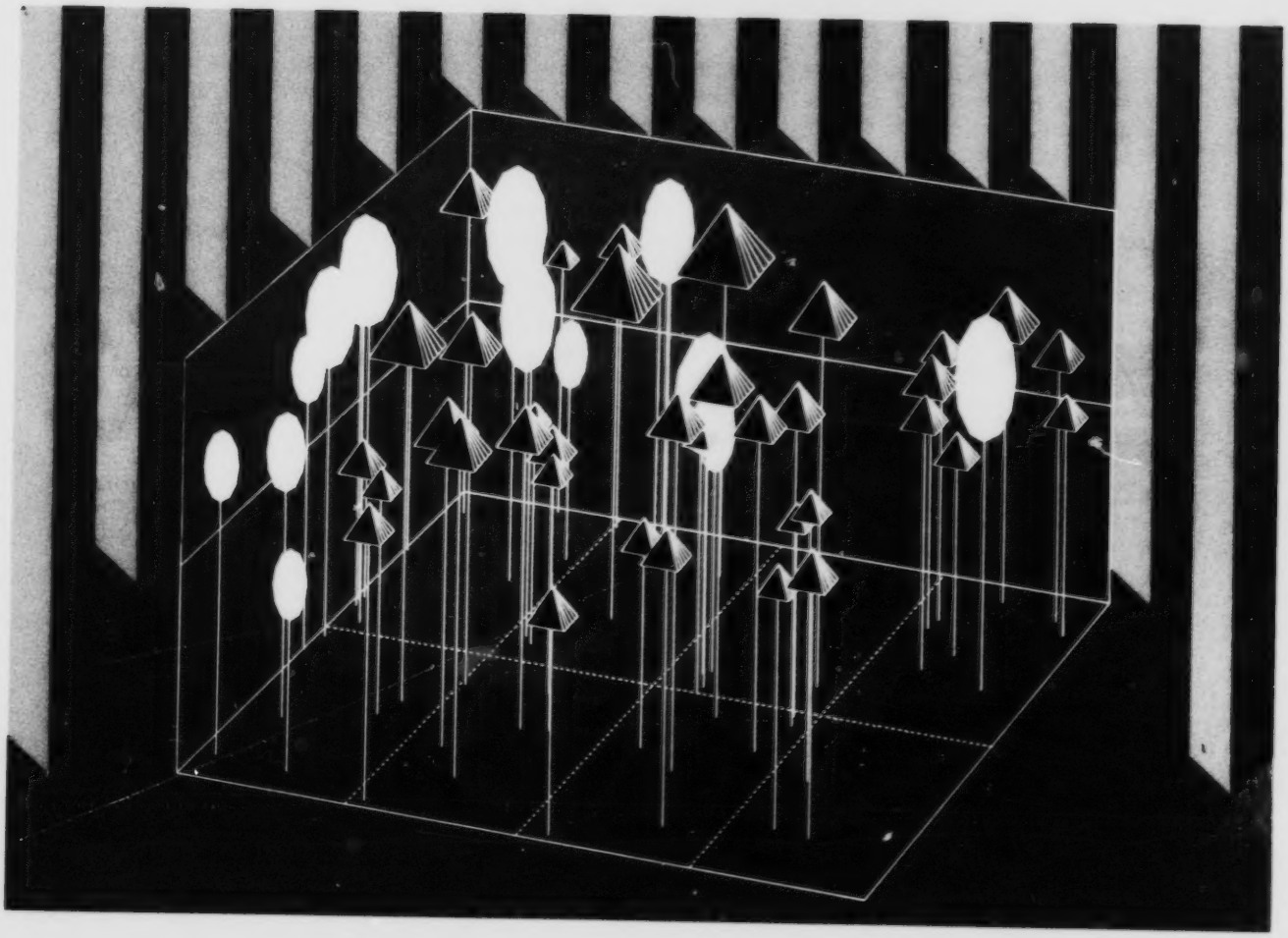
Forestry Canada Forêts Canada

# The Acid Rain National Early Warning System (ARNEWS) plot network

S.P. D'Eon and J.M. Power

Information Report PI-X-91
Petawawa National Forestry Institute



## PETAWAWA NATIONAL FORESTRY INSTITUTE

In common with the rest of Forestry Canada, the Petawawa National Forestry Institute has as its objective the promotion of better management and wiser use of Canada's forest resource to the economic and social benefit of all Canadians. Objectives of program activities carried out at the Institute support this goal through discovery, development, demonstration, implementation, and transfer of innovations. Because it is a national institute, particular emphasis is placed on problems that transcend regional boundaries or that require special expertise and equipment that cannot be duplicated in Forestry Canada regional establishments. Such research is often performed in close cooperation with staff of the regional centres, provincial forest services, and the forest industry.

Research initiatives and technical services at the Institute encompass five major activities:

FOREST GENETICS AND BIOTECHNOLOGY — Integrates projects in tree genetics, soil microbiology, micropropagation, molecular genetics, meteorology, and seed research. It also includes the client services and seed bank operations of the National Tree Seed Centre, a long-standing program with extensive international affiliations.

FOREST MANAGEMENT SYSTEMS — This program integrates projects in fire, remote sensing, modelling, growth and yield, and forest pest management to provide research and development for the formulation and demonstration of forest management systems.

NATIONAL FOREST RESOURCE STATISTICS — Provides biological, technical, and socioeconomic information on Canada's forest-based resources. The program involves progressive development of databases and establishment of new databases and software in support of policy development in forestry. The Forest Inventory Program collates information on the forest resource at a national level, maintains the Canadian Forest Resources Data System, and prepares the national forest inventory.

COMMUNICATIONS — Integrates activities of the library, public awareness, information, and editing and publications projects. The Institute is visited by more than 20 000 people every year. There is a Visitor Centre for the public, self-guided tours, and an extensive education project. The national repository of all scientific and technical publications of the Forestry Canada and the principal Forestry Canada publications distribution centre are both located at PNFI.

THE RESEARCH FOREST — Besides natural stands manipulated in a variety of ways for silvicultural research, the 100 $km^2$ Petawawa Forest contains extensive areas of plantations dating back six decades. Research plantations are a source of growth and yield data derived from cultural experiments, and they are becoming valuable for pedigreed genetic materials for micropropagation and molecular genetics studies. The forest also offers opportunities for short- and long-term testing of forest management strategies.

# THE ACID RAIN NATIONAL EARLY WARNING SYSTEM (ARNEWS) PLOT NETWORK

S.P. D'Eon and J.M. Power

Information Report PI-X-91
Petawawa National Forestry Institute
Forestry Canada
1989

90-00229/

©Minister of Supply and Services Canada 1989
Catalogue No. Fo46-11/91-1989E
ISBN 0-662-17026-1
ISSN 0706-1854
Printed in Canada

Copies of this publication may be obtained free of charge from the following address:

Forestry Canada
Publications Distribution Centre
Petawawa National Forestry Institute
Chalk River, Ontario
K0J 1J0

Telephone: 613-589-2880

A microfiche edition of this publication may be purchased from:

Micromedia Ltd.
Place du Portage
165, Hôtel-de-Ville
Hull, Québec
J8X 3X2

Cette publication est également disponible en français sous le titre **Réseau de parcelles du Dispositif national d'alerte rapide pour les pluies acides.**

## Contents


v Abstract/Résumé

1 A forest health monitoring system

5 Acknowledgments

5 References

7 Newfoundland Region ARNEWS plots – *J. Hudak*
Individual plot descriptions

17 Maritimes Region ARNEWS plots – *L.P. Magasi*
Individual plot descriptions

35 Laurentian Region ARNEWS plots – *D. Lachance*
Individual plot descriptions

61 Great Lakes Region ARNEWS plots – *G.M. Howse and M.J. Applejohn*
Individual plot descriptions

89 Northern Region ARNEWS plots – *H.F. Cerezke*
Individual plot descriptions

103 Pacific Region ARNEWS plots – *G.A. Van Sickle*
Individual plot descriptions

2 Figure 1: National plot map

3 Table 1: Summary of ARNEWS plots

## Abstract

Forestry Canada has established a network of forest plots across Canada for the Acid Rain National Early Warning System. These plots are remeasured on a regular basis to enable detection and monitoring of changes in forest health. The report describes the tree and stand characteristics of each of the 103 plots at the time of plot establishment.



## Résumé

Forêts Canada a établi un réseau de parcelles forestières expérimentales à travers le Canada pour le Dispositif nationale de l'alerte rapide des pluies acides. Ces parcelles ont été remesurées de façon régulière pour surveiller et déceler les changements dans l'état de santé des forêts. Ce rapport traite les caractéristiques des arbres et celles des parcelles au moment de l'installation.

# THE PLOT NETWORK OF THE ACID RAIN NATIONAL EARLY WARNING SYSTEM

## A forest health monitoring system

Both the public and the media generally perceive that acid rain is bad for Canada's forests. This raised consciousness has led to a political initiative to control the pollutants causing acid rain. The scientist, however, has to look at the statement that acid rain damages our forests as an hypothesis that must be proved by scientific means. This process involves identifying all known variables that contribute to poor forest health, and eliminating these before attributing damage to acid rain. Without this process, there may be a danger that poor forest health is attributed to the wrong cause, thereby resulting in a control prescription that may have little or no effect.

Foresters have observed epidemics causing poor forest health well before the existence of acid rain. Considering these past incidents, the possibility of other causes of current poor forest health must be investigated and identified in conjunction with the study of acid rain effects.

Forestry Canada, with its mandate to monitor Canada's forests, has reacted to the acid rain phenomenon by establishing the Acid Rain National Early Warning System (ARNEWS). According to Kondo and Taylor (1984), the objectives of the program are:

1. To detect the possible damage to forest trees and soils caused by acid rain or to identify the damages sustained by Canadian forests (trees and soils) which are not attributable to natural causes or management practices; and

2. Long term monitoring of vegetation and soils to detect future change attributable to acid deposition and other air pollutants in representative forest ecosystems.

To meet these objectives, a plot network was designed to monitor forest health. Due to the high cost of precipitation monitoring and atmospheric analysis, the distribution of pollutants within this network were to be derived from the general pattern of pollutant deposition (Addison 1987).

The 103 plots of the network are strategically located in a variety of sulfate and nitrate deposition zones and forest stands in commercial forests across Canada (See Figure 1). The establishment, monitoring, and much of the sampling of these plots are done by the regional Forest Insect and Disease Survey (FIDS) units following procedures described in a survey manual (Magasi 1988). The plots are used to monitor (Magasi 1988):

- the condition and changes in the condition of forest stands;
- the presence of and fluctuation in biotic and abiotic factors that affect the condition of the forest (insects, diseases, stand changes, etc.)
- the changes and symptoms that indicate factors not attributable to the above that could be early signs of acid rain damage
- the effect of acid rain on the condition of the various economically important tree species.

Measurements are made during plot establishment and at subsequent intervals of assessment of:

1. the location, dimension, and condition of individual trees;

2. tree regeneration and ground vegetation;

3. offplot trees and pests, and

4. offplot samples of soil, foliage, and increment cores.

All data are held in a relational database management system for future analysis with other environmental data on historical insect and disease conditions, climate, acid deposition, forest composition, and soils (Power and D'Eon 1988). The forest cover type, stand age, plot elevation, and year of establishment for each plot are summarized in Table 1.

Figure 1. The ARNEWS plot network.

**Table 1. Summary of ARNEWS Plots**

| Plot number | Province | Elevation (m) | Cover type | Age/ maturity | Year of establishment |
|---|---|---|---|---|---|
| 101 | Nfld. | 107 | balsam fir | semi-mature | 1984 |
| 102 | Nfld. | 152 | balsam fir | semi-mature | 1984 |
| 103 | Nfld. | 213 | balsam fir | semi-mature | 1984 |
| 104 | Nfld. | 198 | black spruce | semi-mature | 1984 |
| 105 | Nfld. | 229 | balsam fir/black spruce | semi-mature | 1984 |
| 106 | Nfld. | 137 | balsam fir/black spruce | immature | 1984 |
| 107 | Nfld. | 122 | balsam fir | immature | 1985 |
| 108 | Nfld. | 46 | balsam fir | immature | 1984 |
| 201 | N.B. | 30 | black spruce | 61 years | 1984 |
| 202 | N.B. | 549 | balsam fir | 55 years | 1984 |
| 203 | N.B. | 427 | sugar maple | 44 years | 1984 |
| 204 | N.B. | 61 | jack pine | 33 years | 1984 |
| 205 | N.B. | 396 | red spruce | 68 years | 1984 |
| 206 | N.B. | 305 | white birch/red spruce | 39 years | 1984 |
| 207 | N.B. | 30 | tamarack/black spruce | 45 years | 1984 |
| 208 | P.E.I. | 30 | spruce/trembling aspen | 26 years | 1984 |
| 209 | N.S. | 91 | red spruce | 65 years | 1984 |
| 210 | N.S. | 122 | red spruce/balsam fir | 61 years | 1984 |
| 211 | N.S. | 122 | eastern white pine | 30 years | 1984 |
| 212 | N.S. | 213 | white birch/balsam fir | 32 years | 1984 |
| 213 | N.S. | 61 | balsam fir/white spruce | 69 years | 1984 |
| 214 | N.S. | 91 | balsam fir/red maple | 54 years | 1984 |
| 215 | N.S. | 122 | white spruce/balsam fir | 34 years | 1984 |
| 216 | N.B. | 340 | balsam fir | over-mature | 1985 |
| 217 | N.B. | 340 | balsam fir/red spruce | mature | 1985 |
| 301 | Qué. | 360 | sugar maple/yellow birch | semi-mature | 1985 |
| 302 | Qué. | 305 | yellow birch/American beech | semi-mature | 1985 |
| 303 | Qué. | 300 | balsam fir/sugar maple | semi-mature | 1985 |
| 304 | Qué. | 275 | red spruce/eastern white pine | mature | 1985 |
| 305 | Qué. | 305 | red spruce | 63 years | 1985 |
| 306 | Qué. | 366 | yellow birch/balsam fir | mature | 1985 |
| 307 | Qué. | 366 | balsam fir/red maple | mature | 1985 |
| 308 | Qué. | 120 | red oak/sugar maple | mature | 1984 |
| 310 | Qué. | 410 | jack pine | 54 years | 1984 |
| 311 | Qué. | 400 | jack pine | 53 years | 1984 |
| 312 | Qué. | 270 | sugar maple/red oak | 140 years | 1985 |
| 313 | Qué. | 455 | yellow birch/black cherry | 44 years | 1985 |
| 314 | Qué. | 275 | sugar maple | 72 years | 1985 |
| 315 | Qué. | 310 | sugar maple/American beech | mature | 1984 |
| 316 | Qué. | 790 | black spruce | 70 years | 1984 |
| 317 | Qué. | 850 | black spruce | 70 years | 1984 |
| 319 | Qué. | 500 | sugar maple | 70 years | 1984 |
| 320 | Qué. | 550 | white birch/red spruce | 72 years | 1984 |
| 321 | Qué. | 900 | balsam fir/white birch | 83 years | 1984 |
| 322 | Qué. | 520 | sugar maple | 90 years | 1984 |
| 323 | Qué. | 335 | red spruce | 70 years | 1984 |
| 324 | Qué. | 170 | red pine | 100 years | 1985 |
| 325 | Qué. | 425 | balsam fir | semi-mature | 1985 |
| 326 | Qué. | 300 | black spruce | immature | 1985 |
| 501 | Ont. | NA | sugar maple | semi-mature | 1984 |
| 502 | Ont. | NA | black spruce | semi-mature | 1984 |
| 503 | Ont. | NA | white birch/sugar maple | semi-mature | 1984 |
| 504 | Ont. | NA | sugar maple/eastern white pine | mature | 1984 |
| 505 | Ont. | NA | sugar maple | mature | 1984 |

**Table 1 (cont.)**

| Plot number | Province | Elevation (m) | Cover type | Age/ maturity | Year of establishment |
|---|---|---|---|---|---|
| 506 | Ont. | NA | sugar maple | semi-mature | 1984 |
| 507 | Ont. | NA | sugar maple | mature | 1984 |
| 508 | Ont. | NA | sugar maple | mature | 1984 |
| 509 | Ont. | NA | jack pine | mature | 1984 |
| 510 | Ont. | NA | black spruce | mature | 1984 |
| 511 | Ont. | NA | white spruce/white birch | semi-mature | 1984 |
| 512 | Ont. | NA | jack pine | semi-mature | 1984 |
| 513 | Ont. | NA | black spruce | semi-mature | 1984 |
| 514 | Ont. | 152 | white spruce | semi-mature | 1985 |
| 515 | Ont. | 152 | Norway spruce | semi-mature | 1985 |
| 516 | Ont. | NA | white birch/red maple | mature | 1985 |
| 517 | Ont. | 374 | eastern white pine | immature | 1985 |
| 518 | Ont. | NA | eastern white pine | semi-mature | 1985 |
| 519 | Ont. | NA | white spruce | semi-mature | 1985 |
| 520 | Ont. | 90 | trembling aspen/white birch | mature | 1985 |
| 521 | Ont. | 353 | jack pine | semi-mature | 1985 |
| 522 | Ont. | NA | jack pine | semi-mature | 1985 |
| 523 | Ont. | NA | jack pine/black spruce | semi-mature | 1985 |
| 524 | Ont. | 300 | jack pine | immature | 1985 |
| 525 | Ont. | NA | sugar maple | mature | 1985 |
| 526 | Ont. | 213 | black oak | mature | 1986 |
| 527 | Ont. | 488 | red oak/red maple | mature | 1986 |
| 801 | Man. | 335 | jack pine | 35 years | 1985 |
| 802 | Man. | 700 | trembling aspen/black spruce | 56 and 38 years | 1985 |
| 803 | Man. | 700 | jack pine | 65 years | 1985 |
| 804 | Man. | 950 | jack pine | 67 years | 1985 |
| 805 | Sask. | 840 | jack pine | 41 years | 1985 |
| 806 | Sask. | 515 | trembling aspen/white spruce | 49 years | 1985 |
| 807 | Alta. | 1430 | lodgepole pine | 69 years | 1985 |
| 808 | Alta. | 1680 | lodgepole pine | 61 years | 1985 |
| 809 | Alta. | 915 | white spruce | 36 years | 1985 |
| 810 | Alta. | 1420 | lodgepole pine | 91 years | 1985 |
| 811 | Sask. | 1300 | white spruce | 43 years | 1986 |
| 812 | Alta. | 510 | white spruce | 70 years | 1986 |
| 901 | B.C. | 305 | Douglas-fir | 33 years | 1984 |
| 902 | B.C. | 366 | western hemlock/w. red cedar | 44 years | 1984 |
| 903 | B.C. | 122 | Douglas-fir | 41 years | 1984 |
| 904 | B.C. | 150 | Douglas-fir | 34 years | 1985 |
| 905 | B.C. | 1545 | Engelmann spruce | 21 years | 1985 |
| 906 | B.C. | 1360 | blue Douglas-fir | 70 years | 1985 |
| 907 | B.C. | 850 | white spruce/alpine fir | 35 years | 1985 |
| 908 | B.C | 225 | western hemlock | 45 years | 1985 |
| 909 | B.C. | 750 | western hemlock | 29 years | 1985 |
| 910 | B.C. | 100 | amabilis fir/western hemlock | 29 years | 1986 |
| 911 | B.C. | 330 | Douglas-fir | 15 years | 1986 |
| 912 | B.C. | 275 | Douglas-fir | 13 years | 1986 |
| 913 | B.C. | 495 | western hemlock/w. red cedar | 35 years | 1986 |
| 914 | B.C. | 165 | amabilis fir/western hemlock | 32 years | 1986 |
| 915 | B.C. | 850 | white spruce/lodgepole pine | 74 and 107 years | 1986 |

This report is a synopsis of the condition of each of the 103 plots as they were at the time of establishment. Each plot is described in a series of panels, as follows:

**Panel 1.** Map of all plot locations for the province.

**Panel 2.** A narrative description of the plot's location and characteristics. The UTM coordinate is provided.

**Panel 3.** A table of tree species characteristics. From measurements of plot trees, statistics by tree species are listed on tree frequency, mean diameter at breast height (DBH), basal area, and mean height.

**Panel 4.** Three-dimensional diagram of the plot trees. Based on tree dimension and locations, a graphic of the plot was generated for a specified view angle using SASGRAPH. Hardwood species are designated as ovals and softwoods as pyramids. Symbols are sized according to DBH. The Y-axes are exaggerated two-fold in comparison to the X and Z axes so as to enhance the view of individual trees. Although these diagrams are produced in black and white for this report, colour can be assigned to any tree to highlight some attribute such as tree health, or to pinpoint tree mortality. A time series of these diagrams can be produced when sufficient remeasurements have been made (Power and D'Eon 1988).

The data shown in this report are a fraction of those gained through plot establishment over the past few years by FIDS. Other data from increment corings and insect and disease assessments contribute to a major part of the database. Remeasurements are made several times each field season, expanding the database and improving the prospect for statistical analysis. In the meantime, the data can be synthesized to improve its integrity and draw out new information. For instance, individual rings from increment corings must be assigned their correct ages to avoid missing years. As well, detailed data can be reduced and presented in a manner that highlights relationships and trends using statistical and graphical means. Following this synthesis, we can better determine the techniques for analyzing poor forest health so as to relate the causes to environmental conditions.

In summary, a substantial investment funded by the Long Range Transportation of Air Pollution (LRTAP) program, with resources and expertise provided by FIDS, has enabled development of a new forest health survey with the creation of 103 nationwide field plots. These plots will now serve as the baseline source of data for scientific research on the health of Canada's forests.

## Acknowledgments

We wish to recognize the six regional Forest Insect and Disease Survey Units of Forestry Canada in their endeavour to establish the ARNEWS plot network. These units supplied the plot descriptions and measurement data from which this report was produced. We thank Drs. P. Addison and B. Moody of Forestry Canada headquarters for their guidance and reviews of this report, and to K. Yourth for data entry into the ARNEWS database.

## References

Addison, P.A. 1987. Monitoring the health of a forest: a Canadian approach. Paper presented at the Symposium on Acid Rain Impacts on Wilderness, Parks and Natural Resources, 4th World Wilderness Congress, September 11-18, 1987. Denver, Colorado.

Feller, M.C. 1986. Analysis and interpretation of stream and precipitation chemistry for the ARNEWS plot at the UBC research forest. Can. For. Serv., Pacific For. Centre. Contract Report.

Kondo, E.S.; Taylor, R.G. 1984. Forest insect and disease conditions in Canada 1984. Can. For. Serv. Ottawa, Ontario.

Magasi, L.P. 1988. Acid Rain National Early Warning System manual on plot establishment and monitoring. Can. For. Serv., Forest Science Directorate Inf. Rep. DPC-X-25.

Palmer, K.A. 1986. The establishment of cryptogamic biomonitoring subplots to supplement ARNEWS plots. Can. For. Serv., Pacific For. Centre. Contract Report.

Power, J.M.; D'Eon, S.P. 1988. Data management for the Acid Rain National Early Warning System. Paper presented at the North American Forestry Commission Joint Meeting of the Forest Insect and Disease, and Air Pollution Working Groups, October 24-27, 1988. Sault Ste. Marie, Ontario.

## Newfoundland Region ARNEWS Plots

*J. Hudak*

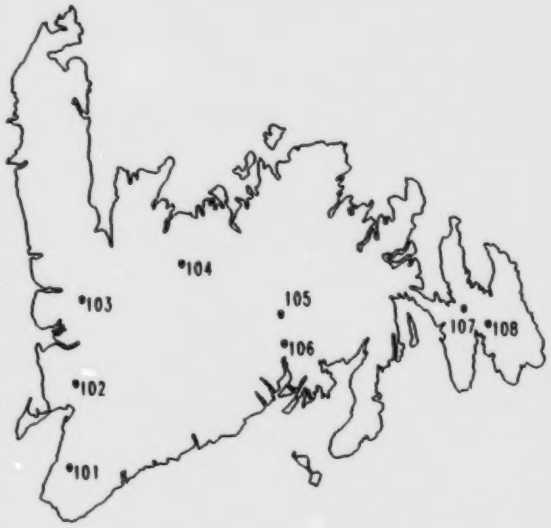
A total of eight permanent plots were established in the Newfoundland and Labrador Region. All plots are located on Newfoundland - three in the west, three in the central region, and two in the east. They are representative of local forest cover types of semi-mature age class. There are plans to establish one plot in Labrador to coincide with the remeasurement of the other plots.

Contact was established with other federal and provincial government agencies working on various aspects of acid rain in Newfoundland, such as the Department of Fisheries and Oceans, Inland Waters Directorate, Atmospheric Environment Service, and Environmental Protection Service of Department of Environment, the Newfoundland Department of Environment, and the Memorial University of Newfoundland. Representatives of these agencies formed the Newfoundland Acid Rain Technical Group (NARTG) which meets twice a year for exchange of information.

The descriptions of the eight Newfoundland Region ARNEWS plots follow.

# PLOT NUMBER 101

ARNEWS PLOTS: NEWFOUNDLAND




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 41 | 12.9 | 13.9 | 7.4 |
| totals and averages: | 41 | 12.9 | 13.9 | 7.4 |
| standing dead trees: | 0 | | | |

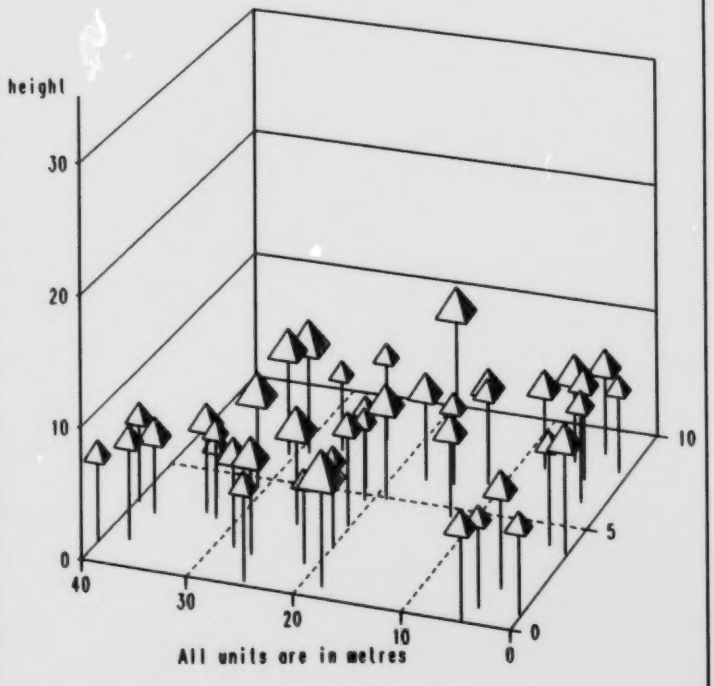
Highlands River

UTM: 21 368 5329

An even-aged semi-mature balsam fir stand in the Corner Brook section of the Boreal Forest Region. The plot is located in Forest Management Unit 14 in western Newfoundland and was precommercially thinned. The plot is flat and has an elevation of 107 m. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=101 YEAR=1984



# PLOT NUMBER 102

ARNEWS PLOTS: NEWFOUNDLAND

PLOT SPECIES CHARACTERISTICS

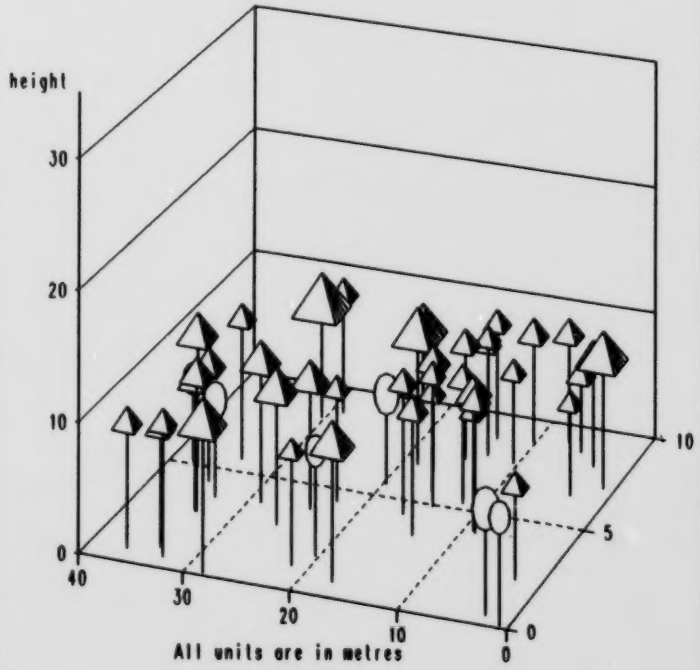
| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 40 | 13.7 | 15.7 | 9.7 |
| white spruce | 1 | 10.2 | 0.2 | 7.5 |
| yellow birch | 5 | 11.7 | 1.3 | 7.7 |
| white birch | 1 | 10.1 | 0.2 | 6.5 |
| totals and averages: | 47 | 13.3 | 17.4 | 9.4 |
| standing dead trees: | 0 | | | |

Gallants Road

UTM: 21 412 5392

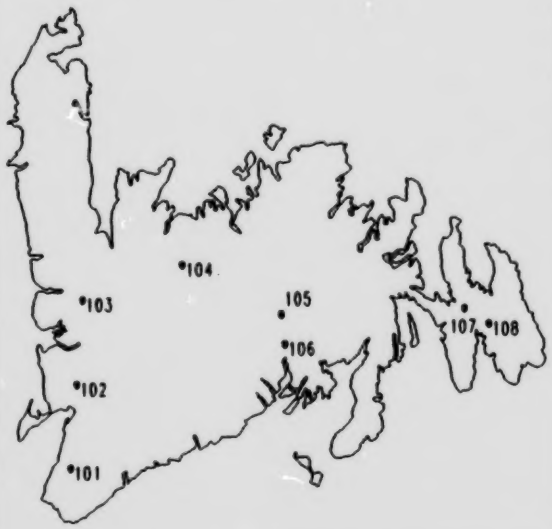
An even-aged semi-mature balsam fir stand in the Corner Brook section of the Boreal Forest Region. The plot is located in Forest Management Unit 14 in western Newfoundland. The plot has a northwesterly exposure and an elevation of 152 m. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=102 YEAR=1984



# PLOT NUMBER 103

ARNEWS PLOTS: NEWFOUNDLAND




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 84 | 14.5 | 38.2 | 11.2 |
| white spruce | 1 | 15.1 | 0.4 | 13.0 |
| black spruce | 1 | 26.5 | 1.3 | 16.0 |
| white birch | 3 | 29.3 | 5.3 | 12.0 |
| totals and averages: | 89 | 15.1 | 45.4 | 11.3 |
| standing dead trees: | 3 | | | |

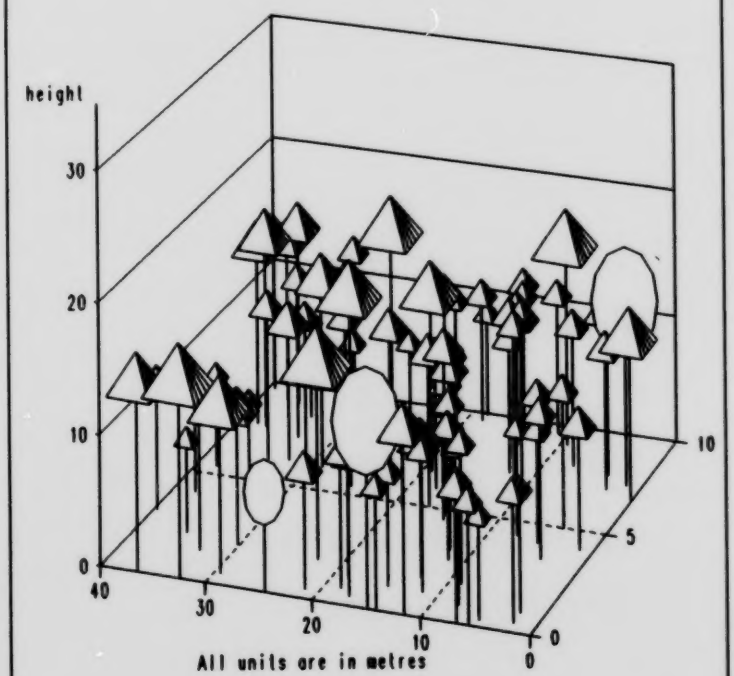
Big Bonne Bay Pond

UTM: 21 461 5465

An even-aged natural stand of balsam fir in the Corner Brook section of the Boreal Forest Region. The plot is located in Forest Management Unit 16 in western Newfoundland, has a southwesterly exposure, and an elevation of 213 m. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=103 YEAR=1984



# PLOT NUMBER 104

ARNEWS PLOTS: NEWFOUNDLAND

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| tamarack | 1 | 16.2 | 0.5 | 10.0 |
| black spruce | 122 | 12.2 | 36.4 | 8.5 |
| totals and averages: | 123 | 12.2 | 36.9 | 8.5 |
| standing dead trees: | 28 | | | |

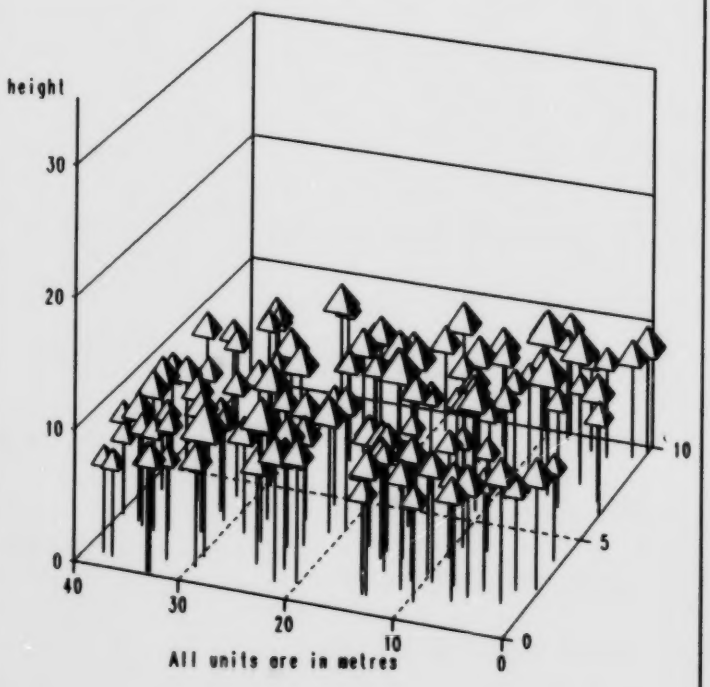
Crooked Bog, 19.2 km west of Badger

UTM: 21 566 5443

An even-aged semi-mature natural black spruce stand in the Grand Falls section of the Boreal Forest Region. Located in Forest Management Unit 9 in central Newfoundland, the plot is flat and has an elevation of 198 m. Established in 1984.

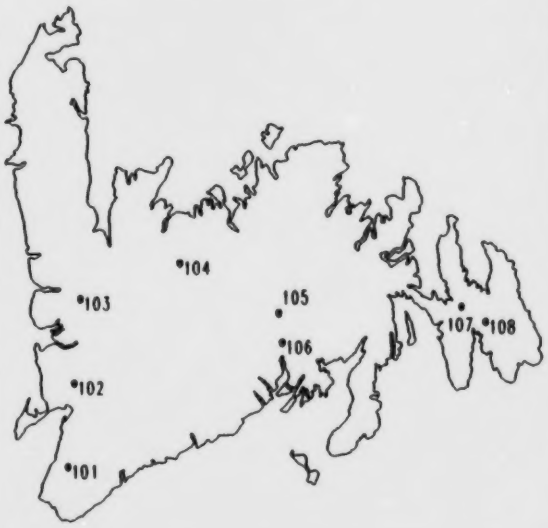
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=104 YEAR=1984



# PLOT NUMBER 105

ARNEWS PLOTS: NEWFOUNDLAND



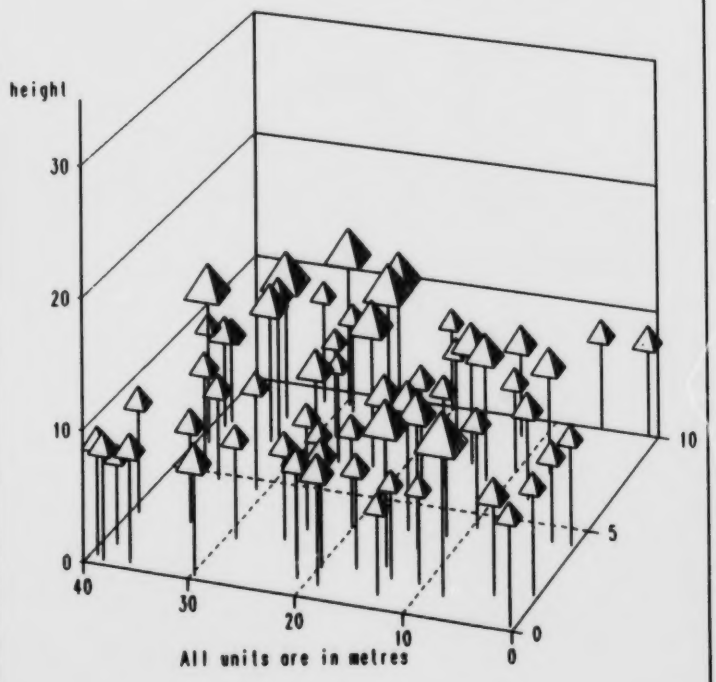

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 42 | 11.8 | 11.8 | 8.3 |
| black spruce | 21 | 15.3 | 10.0 | 10.3 |
| totals and averages: | 63 | 12.9 | 21.8 | 9.0 |
| standing dead trees: | 25 | | | |

Headwater Pond, Department of Fisheries and Oceans experimental area
UTM: 21 613 5347

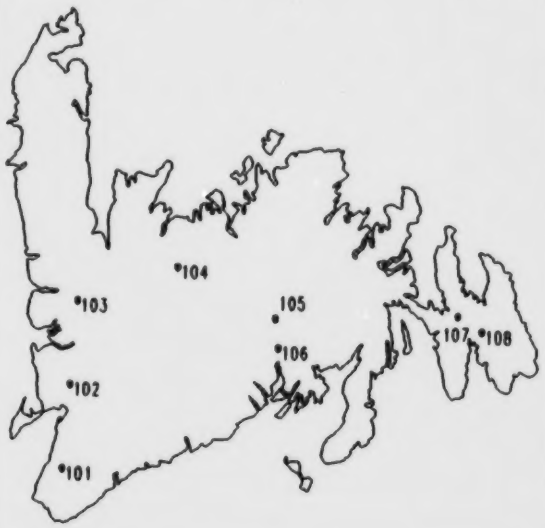
An uneven-aged balsam fir – black spruce stand in the Newfoundland-Labrador Barrens section of the Boreal Forest Region. Located in Forest Management Unit 6 in central Newfoundland, the plot is flat and has an elevation of 229 m. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=105 YEAR=1985



# PLOT NUMBER 106

ARNEWS PLOTS: NEWFOUNDLAND



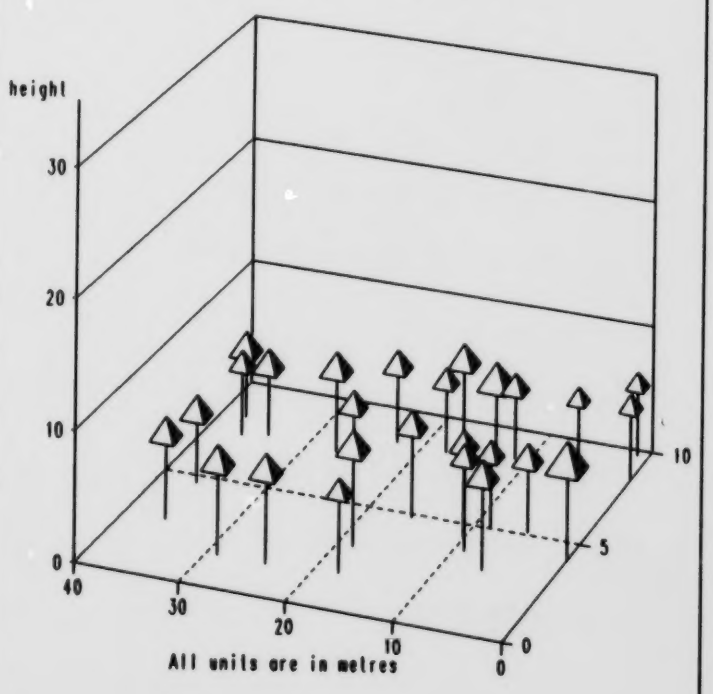

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 18 | 11.7 | 4.9 | 6.6 |
| black spruce | 8 | 13.9 | 3.1 | 6.9 |
| totals and averages: | 26 | 12.4 | 8.0 | 6.7 |
| standing dead trees: | 3 | | | |

Bay D'Espoir Highway, 8.5 km south of Twillick Brook
UTM: 21 604 5321

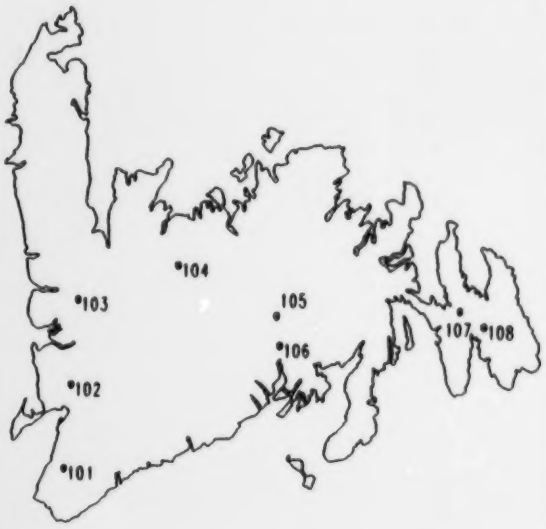
An immature even-aged stand of balsam fir in the Newfoundland-Labrador Barrens section of the Boreal Forest Region. The plot is located in Forest Management Unit 7 in south-central Newfoundland and was precommercially thinned in 1977. The plot has a southeasterly exposure, an elevation of 137 m, and was established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=106 YEAR=1984



# PLOT NUMBER 107

ARNEWS PLOTS: NEWFOUNDLAND




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 46 | 11.4 | 12.2 | 8.1 |
| white spruce | 3 | 10.8 | 0.6 | 6.5 |
| totals and averages: | 49 | 11.4 | 12.9 | 8.0 |
| standing dead trees: | 0 | | | |

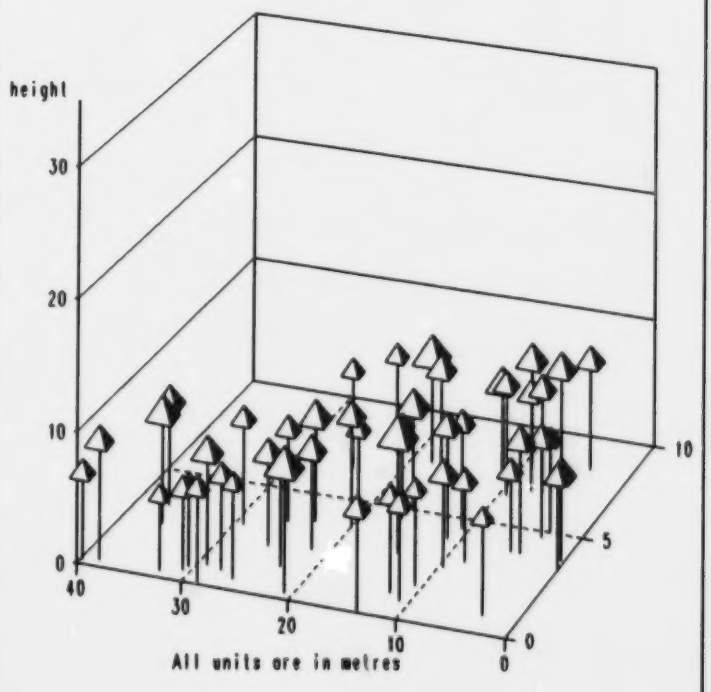
Long Harbour

UTM: 22 298 5262

An even-aged immature balsam fir stand in the Avalon section of the Boreal Forest Region. The plot is located in Forest Management Unit 1 on the Avalon Peninsula. The plot has a westerly exposure, an elevation of 122 m, and was established in 1985.

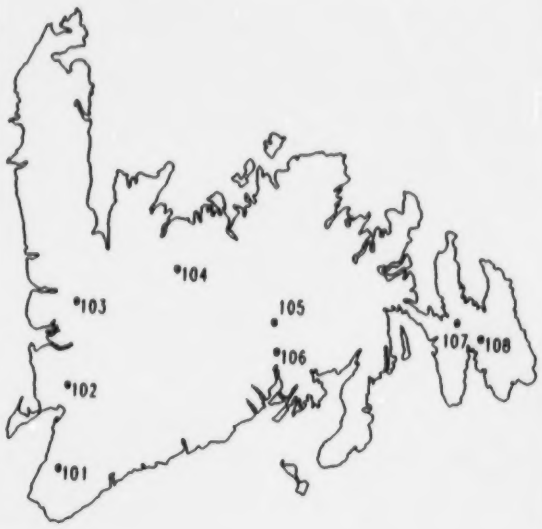
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=107 YEAR=1985



# PLOT NUMBER 108

ARNEWS PLOTS: NEWFOUNDLAND




PLOT SPECIES CHARACTERISTICS

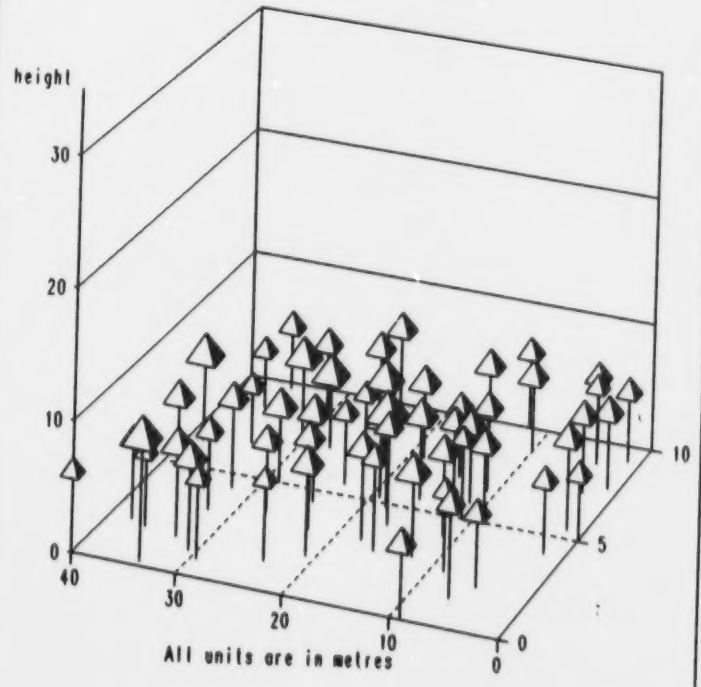
| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 58 | 12.1 | 17.0 | 6.6 |
| totals and averages: | 58 | 12.1 | 17.0 | 6.6 |
| standing dead trees: | 1 | | | |

Salmonier Line, 0.7 km northeast of Back River

UTM: 22 320 5230

An even-aged immature balsam fir stand located in the Avalon section of the Boreal Forest Region. The plot is located in Forest Management Unit 1 on the Avalon Peninsula and was precommercially thinned in 1978. The plot has a southerly exposure, an elevation of 46 m, and was established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=108 YEAR=1984



## Maritimes Region ARNEWS plots

*L.P. Magasi*

ARNEWS plots in the Maritimes were established in accordance with rules stated in the survey manual (Magasi 1988).

Plots were established in natural stands representative of forests in the area, containing several tree species of economic importance, rather than in pure stands. The only single species plot (No. 211) is an eastern white pine stand in western Nova Scotia. The lack of suitable acid rain-type monitoring stations at appropriate locations resulted in the establishment of only three plots near genuine pollution monitoring stations; plot 201 at the Acadia Forest Experiment Station in New Brunswick, and plots 210 and 211 adjacent to Kejimkujik National Park in Nova Scotia, the site of an integrated environmental research effort.

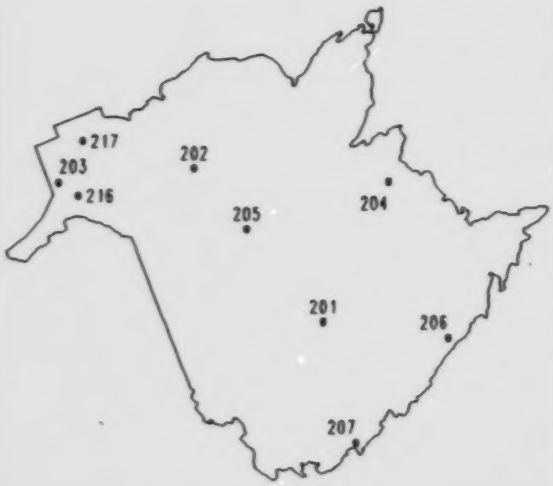
Two of the plots (Nos. 216 and 217 were established at the request of and in cooperation with Fraser Inc. in northwestern New Brunswick. Monitoring these plots is a joint effort between FIDS and the company.

To ensure long-term plot security, all plots have been established on provincial crown land with a suitable buffer zone. The plots are registered with both the provincial authorities and industry responsible for management of that particular area.

The descriptions of the 17 Maritimes Region ARNEWS plots follow.

# PLOT NUMBER 201

ARNEWS PLOTS: NEW BRUNSWICK



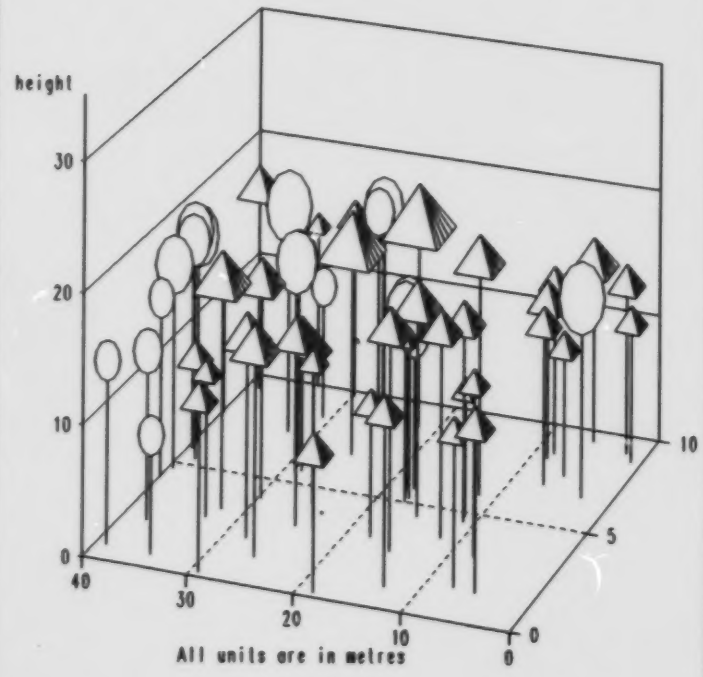

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| tamarack | 1 | 30.2 | 1.7 | 17.5 |
| black spruce | 36 | 15.8 | 18.8 | 13.9 |
| red maple | 16 | 16.3 | 8.7 | 14.3 |
| white birch | 4 | 19.8 | 3.1 | 16.1 |
| totals and averages: | 57 | 16.5 | 32.4 | 14.2 |
| standing dead trees: | 9 | | | |

Acadia Forest Exp. Station, Sunbury Co.
UTM: 19 709 5100

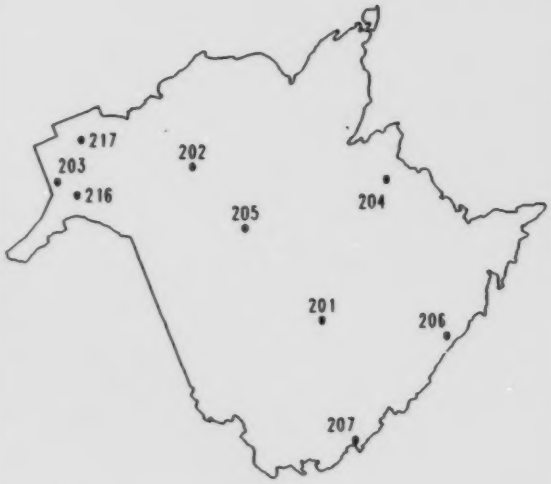
An uneven-aged natural stand of black spruce-red maple cover type on the border of the Bantalor district of the Magaguadavic-Hillsborough ecoregion (sugar maple-hemlock-pine zone) and the Grand Lake district of the Maritime lowlands ecoregion (red spruce-hemlock-pine zone). The plot is flat with an elevation 30 m and an average tree age of 61 years. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=201 YEAR=1984



# PLOT NUMBER 202

ARNEWS PLOTS: NEW BRUNSWICK




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 34 | 18.9 | 27.1 | 12.7 |
| white spruce | 2 | 22.7 | 2.6 | 12.2 |
| yellow birch | 1 | 17.2 | 0.5 | 13.5 |
| white birch | 4 | 16.8 | 2.2 | 13.7 |
| totals and averages: | 41 | 18.8 | 32.5 | 12.8 |
| standing dead trees: | 5 | | | |

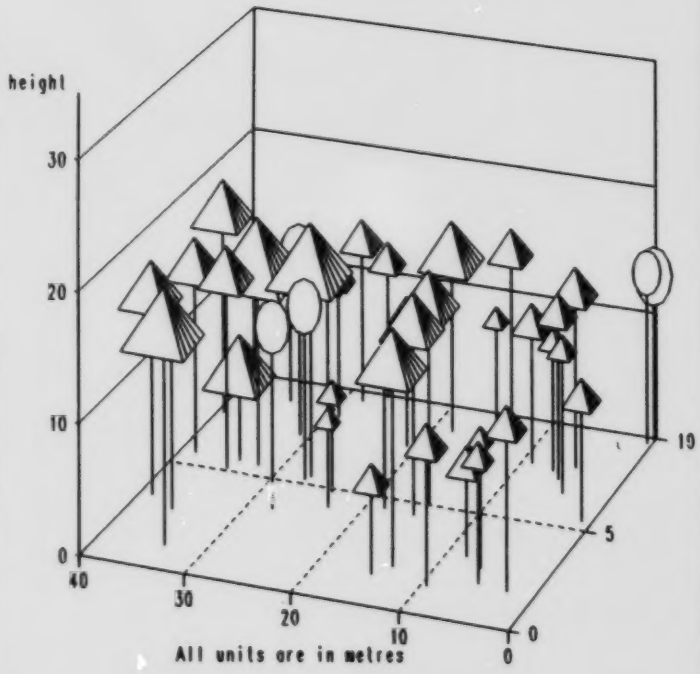
Mount Carleton, Northumberland Co.

UTM: 19 656 5247

An uneven-aged natural stand of balsam fir-white birch cover type in the St. Quentin district of the Maritime Uplands ecoregion (sugar maple-yellow birch-fir zone). The plot has an elevation of 549 m, with a southerly exposure, and an average tree age of 55 years. Established in 1984.

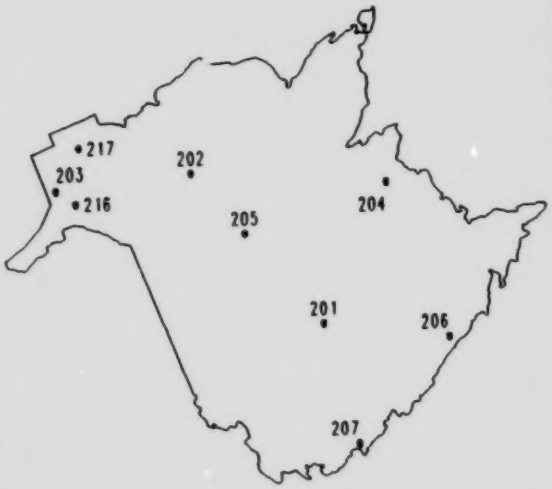
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=202 YEAR=1984



# PLOT NUMBER 203

ARNEWS PLOTS: NEW BRUNSWICK




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 31 | 17.1 | 20.1 | 14.3 |
| yellow birch | 5 | 17.6 | 3.3 | 14.4 |
| totals and averages: | 36 | 17.2 | 23.5 | 14.3 |
| standing dead trees: | 1 | | | |

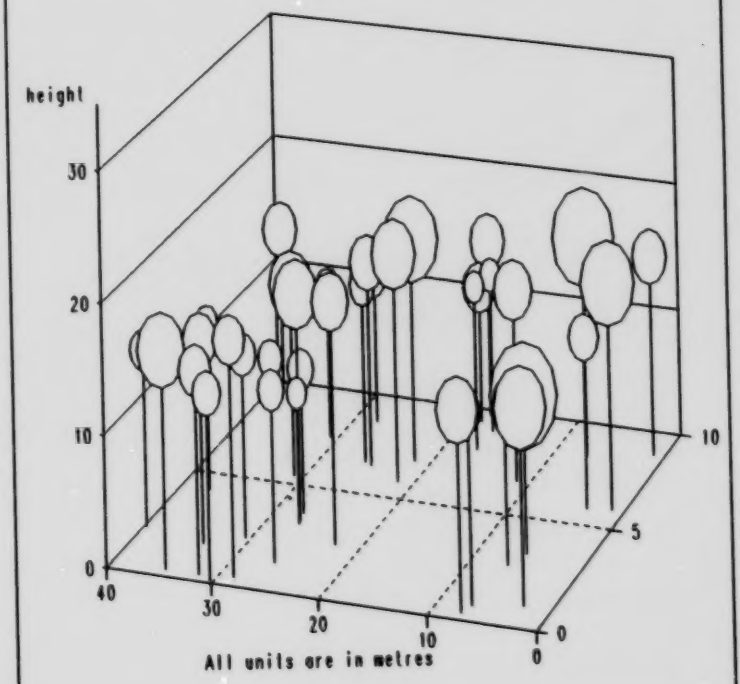
Halfway, Madawaska County

UTM: 19 552 5274

An uneven-aged natural stand of sugar maple cover type in the Gounamitz district of the Maritime Uplands ecoregion (sugar maple-yellow birch-fir zone). The plot has an elevation of 426 m, with a southeasterly exposure, and an average tree age of 44 years. Established in 1984.

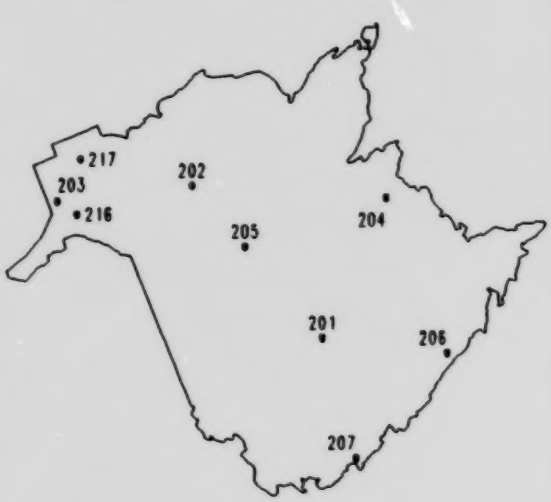
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=203 YEAR=1984



# PLOT NUMBER 204

ARNEWS PLOTS: NEW BRUNSWICK




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| black spruce | 6 | 11.6 | 1.6 | 11.0 |
| jack pine | 62 | 16.2 | 34.0 | 15.2 |
| totals and averages: | 68 | 15.8 | 35.6 | 14.8 |
| standing dead trees: | 9 | | | |

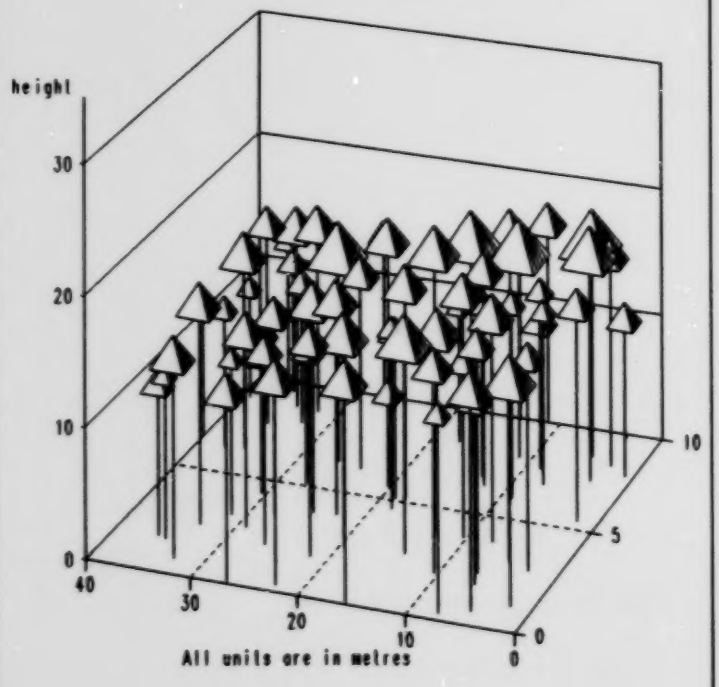
St. Luc, Kent County

UTM: 20 337 5178

An uneven-aged natural stand of jack pine cover type in the Harcourt district of the Maritime Lowlands ecoregion (red spruce-hemlock-pine zone). The plot is flat with an elevation of 60 m and the average age of the trees is 33 years. Established in 1984.

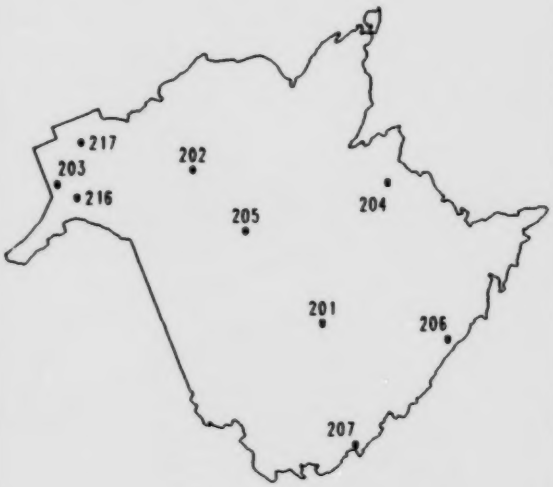
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=204 YEAR=1984



# PLOT NUMBER 205

ARNEWS PLOTS: NEW BRUNSWICK




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 6 | 13.9 | 2.4 | 12.1 |
| red spruce | 45 | 18.4 | 33.9 | 13.3 |
| white birch | 1 | 15.0 | 0.4 | 13.0 |
| totals and averages: | 52 | 17.8 | 36.7 | 13.0 |
| standing dead trees: | 12 | | | |

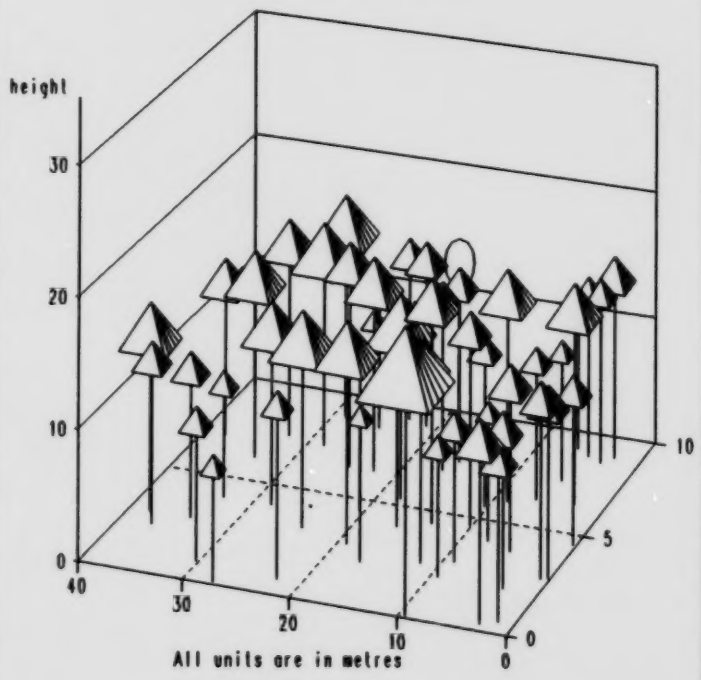
South Dungarvon River, Northumberland Co.

UTM: 19 678 5188

An uneven-aged natural stand of red spruce cover type in the Rocky Brook district of the Maritime Uplands ecoregion (sugar maple-yellow birch-fir zone). The plot has an elevation of 400 m, with a southerly exposure, and the average tree age is 68 years. Established in 1984.

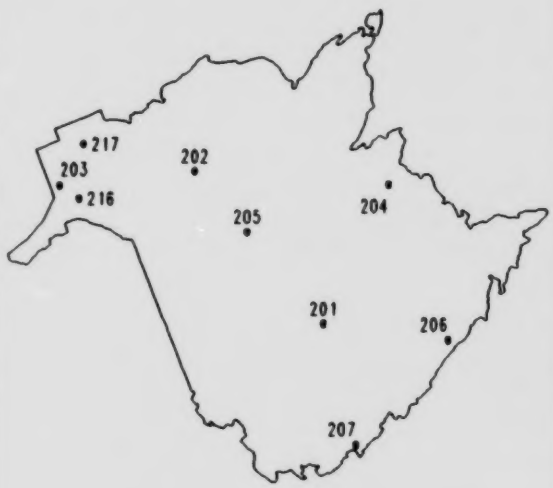
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=205 YEAR=1984



# PLOT NUMBER 206

ARNEWS PLOTS: NEW BRUNSWICK




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| red spruce | 13 | 17.8 | 9.0 | 10.4 |
| red maple | 2 | 15.6 | 0.9 | 13.1 |
| yellow birch | 2 | 14.4 | 0.8 | 12.6 |
| white birch | 38 | 13.5 | 14.0 | 11.8 |
| totals and averages: | 55 | 14.6 | 24.9 | 11.6 |
| standing dead trees: | 1 | | | |

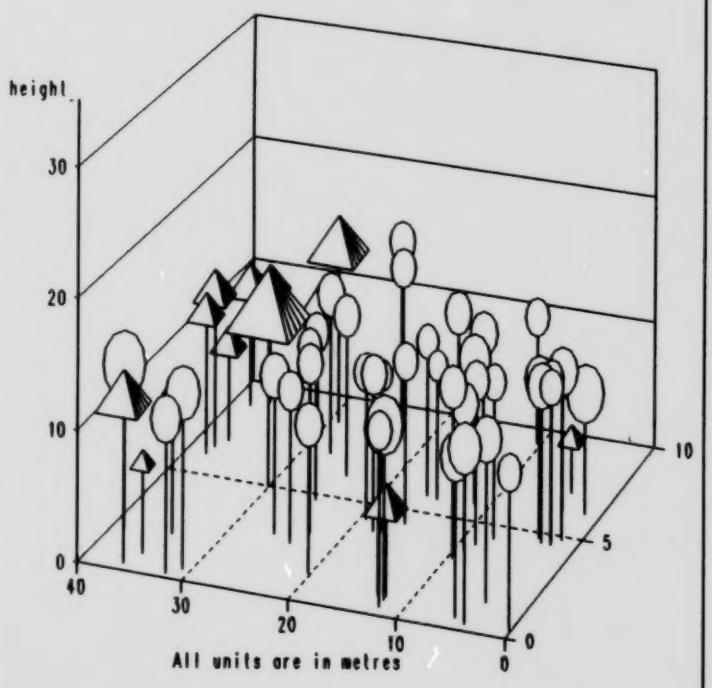
Martin Head, St. John County

UTM: 20 328 5049

An uneven-aged natural stand of white birch cover type in the Musquash district of the Fundy Bay ecoregion (spruce-fir coast zone). The plot is flat with an elevation of 300 m and the average age of the trees is 39 years. Established in 1984.

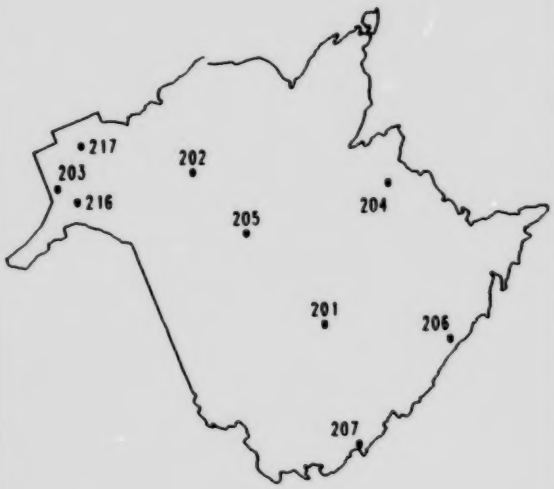
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=206 YEAR=1984



# PLOT NUMBER 207

ARNEWS PLOTS: NEW BRUNSWICK




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 6 | 14.9 | 2.7 | 8.4 |
| tamarack | 32 | 18.5 | 24.3 | 14.5 |
| black spruce | 17 | 16.2 | 9.2 | 11.5 |
| totals and averages: | 55 | 17.4 | 36.3 | 12.9 |
| standing dead trees: | 9 | | | |

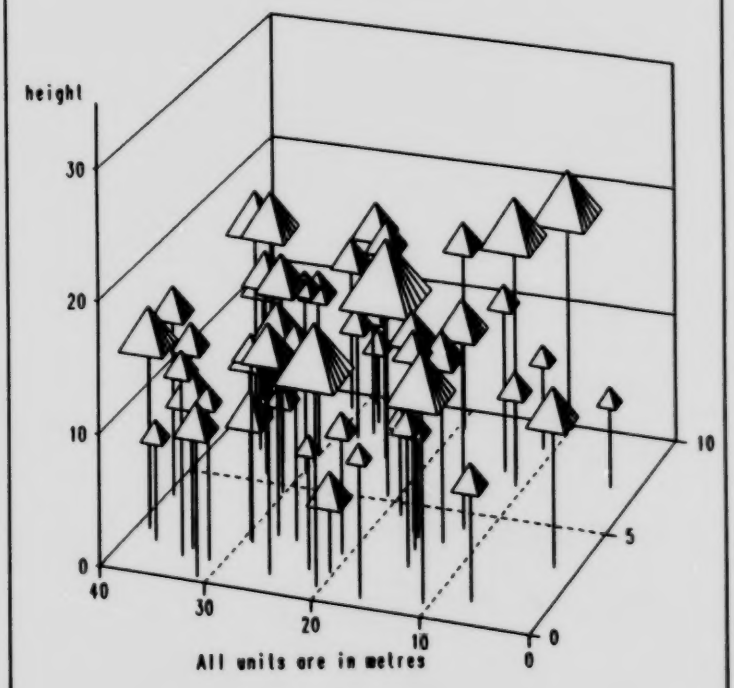
Lapreau Falls, St. John County

UTM: 19 700 5004

An uneven-aged natural stand of tamarack-balsam fir cover type in the Musquash district of the Fundy Bay ecoregion (spruce-fir coast zone). The plot is flat with an elevation of 30 m and the average tree age is 45 years. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=207 YEAR=1984



# PLOT NUMBER 208

ARNEWS PLOTS: PRINCE EDWARD ISLAND

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 6 | 13.8 | 2.2 | 10.2 |
| spruce | 39 | 13.7 | 14.8 | 9.3 |
| white spruce | 5 | 13.5 | 1.8 | 7.6 |
| water birch | 1 | 11.4 | 0.2 | 8.8 |
| trembling aspen | 15 | 11.7 | 4.1 | 10.5 |
| black cherry | 1 | 10.0 | 0.1 | 9.8 |
| totals and averages: | 67 | 13.1 | 23.5 | 9.5 |
| standing dead trees: | 1 | | | |

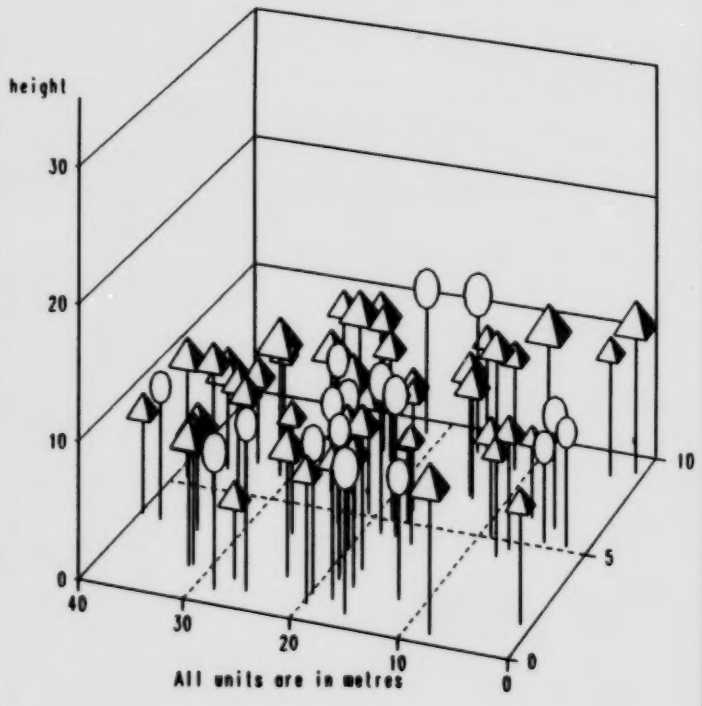
Goose River, Kings County

UTM: 20 538 5143

An uneven-aged natural stand of spruce-fir cover type in the Prince Edward Island district of the Maritime Lowlands ecoregion (red spruce-hemlock-pine zone). The plot is flat with an elevation of 30 m and the average age of the trees is 26 years. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=208 YEAR=1984



# PLOT NUMBER 209

ARNEWS PLOTS: NOVA SCOTIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 2 | 10.9 | 0.4 | 11.0 |
| red spruce | 57 | 17.2 | 35.7 | 12.4 |
| red maple | 2 | 12.5 | 0.6 | 12.3 |
| white birch | 1 | 11.8 | 0.2 | 12.4 |
| totals and averages: | 62 | 16.8 | 37.1 | 12.4 |
| standing dead trees: | 4 | | | |

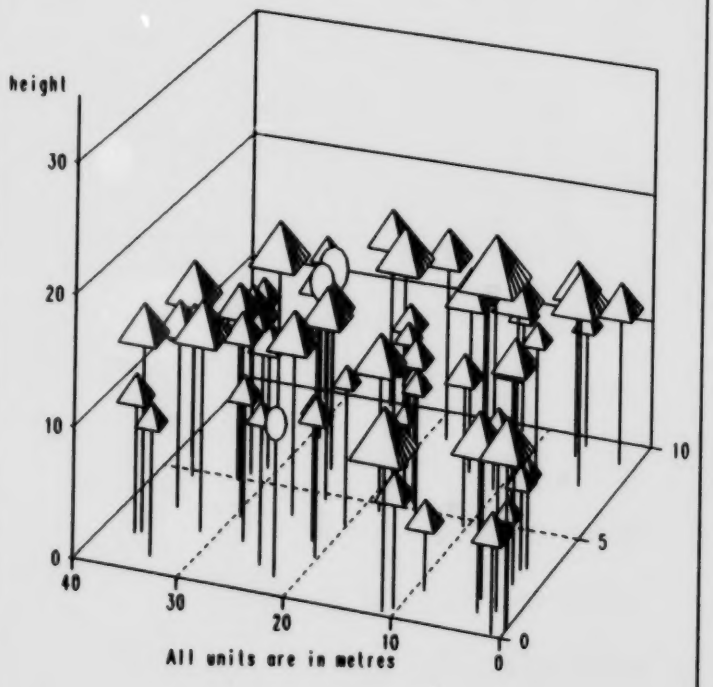
Chignecto Game Sanctuary, Cumberland Co.

UTM: 20 396 5048

An even-aged natural stand of red spruce cover type in the Oxford district of the Maritime Lowlands ecoregion (red spruce-hemlock-pine zone). The plot is flat with an elevation of 61 m and the average age of the trees is 65 years. Established in 1984.

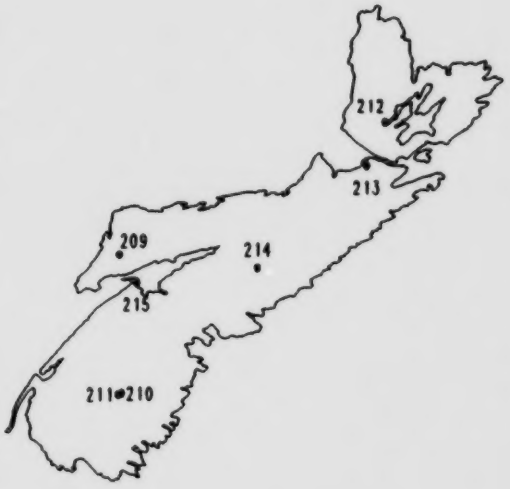
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=209 YEAR=1984



# PLOT NUMBER 210

ARNEWS PLOTS: NOVA SCOTIA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 16 | 13.4 | 5.9 | 9.7 |
| red spruce | 21 | 14.8 | 9.6 | 11.3 |
| eastern white pine | 8 | 21.2 | 8.0 | 14.2 |
| red maple | 2 | 27.6 | 3.1 | 16.7 |
| white birch | 4 | 19.0 | 2.9 | 16.4 |
| ash | 3 | 19.8 | 2.3 | 16.4 |
| totals and averages: | 54 | 16.4 | 32.0 | 12.1 |
| standing dead trees: | 1 | | | |

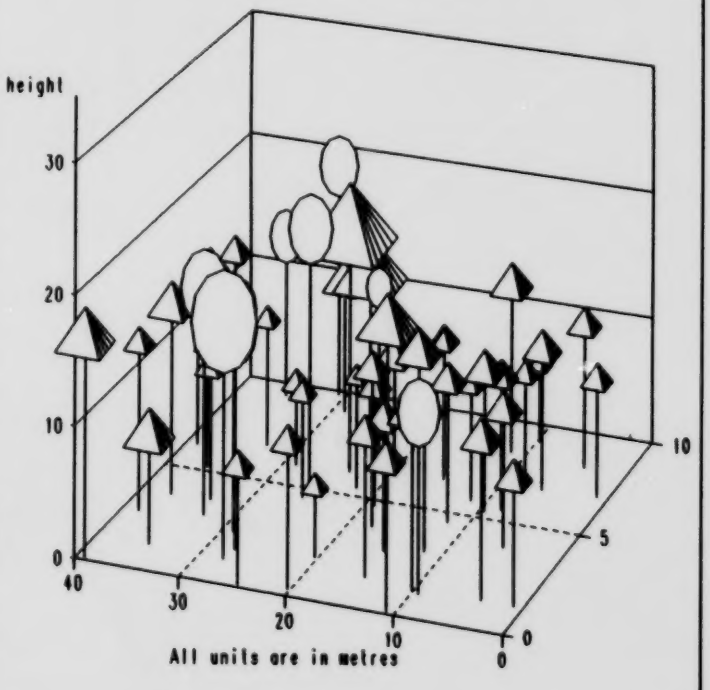
Hemlock Hill, Queens County

UTM: 20 330 4905

An uneven-aged natural stand of softwood-hardwood cover type in the La Have district of the Magaguadavic-Hillsborough ecoregion (sugar maple hemlock-pine zone). The plot is at 91 m elevation, with a southwesterly exposure, and the average age of the trees is 61 years. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=210 YEAR=1984



# PLOT NUMBER 211

ARNEWS PLOTS: NOVA SCOTIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| eastern white pine | 29 | 20.0 | 23.9 | 13.6 |
| totals and averages: | 29 | 20.0 | 23.9 | 13.6 |
| standing dead trees: | 0 | | | |

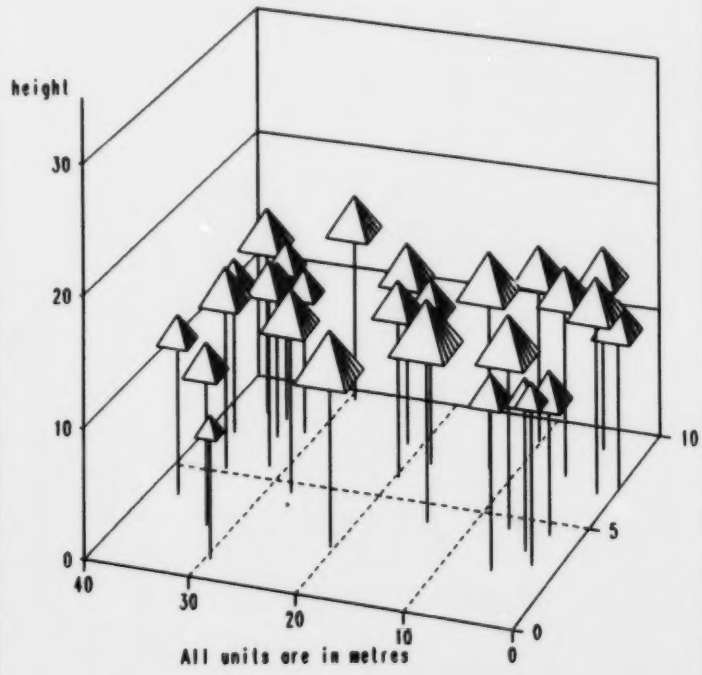
Rossignol Lake, Queens County

UTM: 20 327 4905

An even-aged natural stand of eastern white pine in the La Have district the Magaguadavic-Hillsborough ecoregion (sugar maple-hemlock-pine zone). The plot is flat with an elevation of 91 m and the average age of the trees is 30 years. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=211 YEAR=1984



# PLOT NUMBER 212

ARNEWS PLOTS: NOVA SCOTIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 33 | 12.9 | 11.2 | 9.0 |
| white spruce | 12 | 15.6 | 6.2 | 9.9 |
| red maple | 5 | 15.2 | 2.3 | 11.2 |
| white birch | 13 | 13.9 | 5.6 | 11.1 |
| totals and averages: | 63 | 13.8 | 25.4 | 9.8 |
| standing dead trees: | 14 | | | |

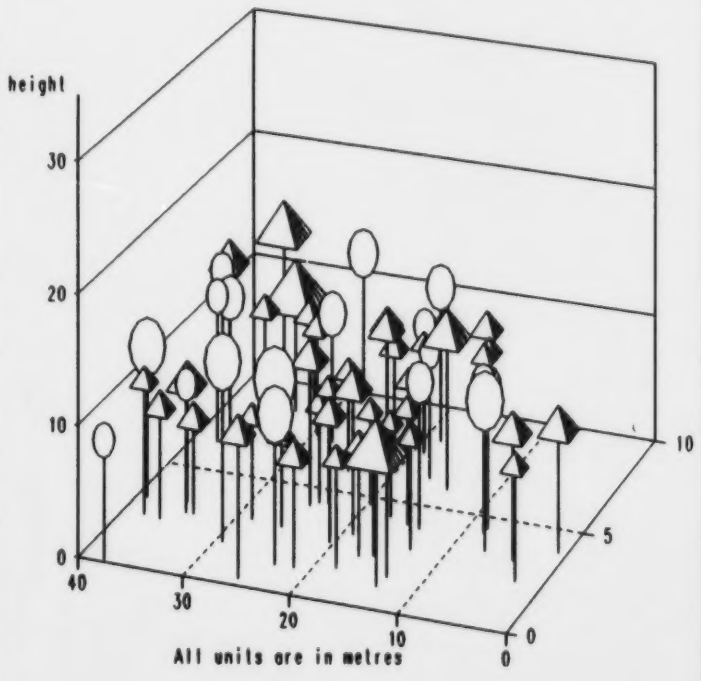
Whycocomagh, Inverness County

UTM: 20 646 5092

An uneven-aged natural stand of balsam fir cover type in the Cape Breton Hills district of the Maritime Uplands ecoregion (sugar maple-yellow birch-pine zone). The plot is at 61 m elevation, with a southerly exposure, and the average age of the trees is 32 years. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=212 YEAR=1984



# PLOT NUMBER 213

ARNEWS PLOTS: NOVA SCOTIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 54 | 14.2 | 22.6 | 11.9 |
| white spruce | 19 | 15.9 | 9.9 | 11.7 |
| eastern hemlock | 3 | 12.0 | 0.8 | 6.7 |
| red maple | 8 | 12.6 | 2.5 | 12.7 |
| yellow birch | 2 | 11.9 | 0.5 | 10.5 |
| totals and averages: | 86 | 14.3 | 36.6 | 11.7 |
| standing dead trees: | 13 | | | |

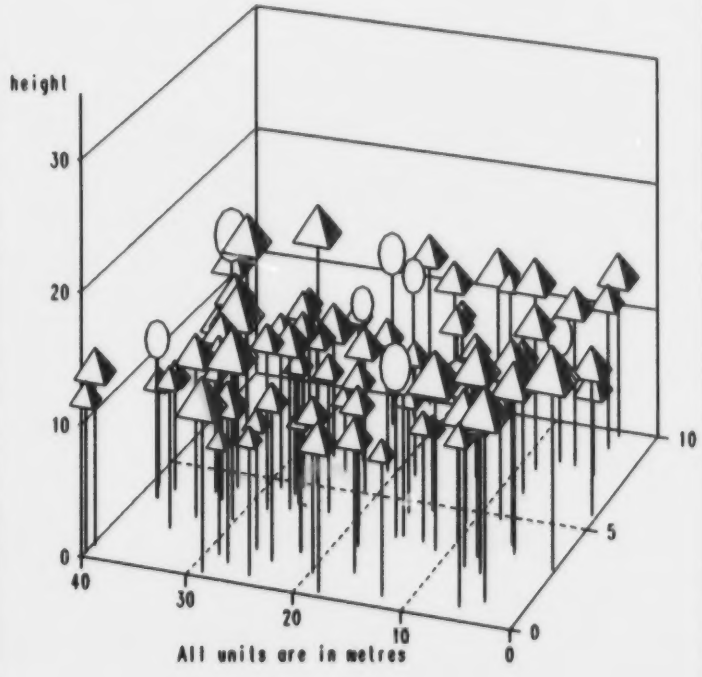
Frankville, Antigonish County

UTM: 20 612 5055

An even-aged natural stand of balsam fir-white spruce cover type in the Guysborough-Bras d'Or district of the Restigouche-Bras d'Or ecoregion (sugar maple-hemlock-pine zone). The plot is flat with an elevation of 61 m and the average age of the trees is 69 years. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=213 YEAR=1984



# PLOT NUMBER 214

ARNEWS PLOTS: NOVA SCOTIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 34 | 12.4 | 10.5 | 11.2 |
| white spruce | 5 | 21.1 | 4.4 | 14.0 |
| red spruce | 1 | 12.3 | 0.2 | 12.5 |
| red maple | 29 | 12.1 | 8.6 | 12.3 |
| largetooth aspen | 2 | 14.2 | 0.8 | 13.5 |
| totals and averages: | 71 | 12.9 | 24.7 | 11.9 |
| standing dead trees: | 0 | | | |

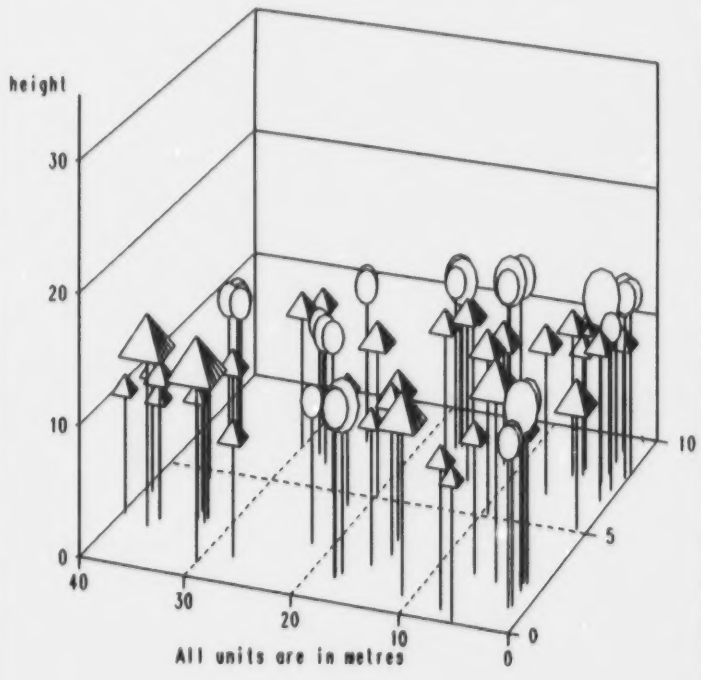
Middle Musquodoboit, Halifax County

UTM: 20 486 4989

An even-aged natural stand of balsam fir-red maple cover type in the Musquodoboit Hills district of the Maritime Uplands ecoregion (sugar maple-yellow birch-fir zone). The plot is flat with an elevation of 122 m and the average age of the trees is 54 years. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=214 YEAR=1984



# PLOT NUMBER 215

ARNEWS PLOTS: NOVA SCOTIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 17 | 15.4 | 8.5 | 10.5 |
| white spruce | 25 | 18.0 | 17.6 | 10.1 |
| red spruce | 10 | 21.2 | 10.0 | 11.4 |
| totals and averages: | 52 | 17.8 | 36.1 | 10.5 |
| standing dead trees: | 0 | | | |

Blomidon Provincial Park, Kings County

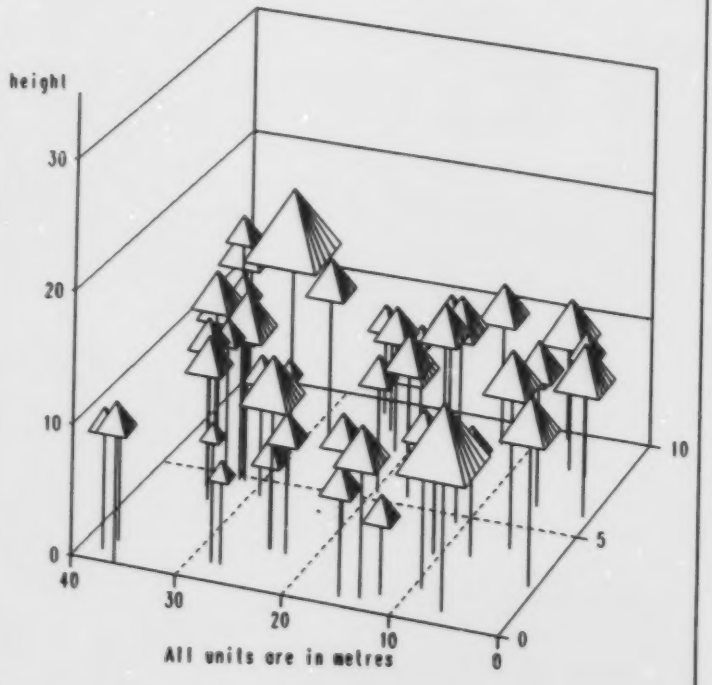
UTM: 20 394 5013

An uneven-aged natural stand of softwood cover type in the North Mountain district of the Fundy Bay ecoregion (spruce-fir coast zone). The plot is at 152 m elevation, with a northwesterly exposure, and the average age of the trees is 34 years.

Established in 1984.

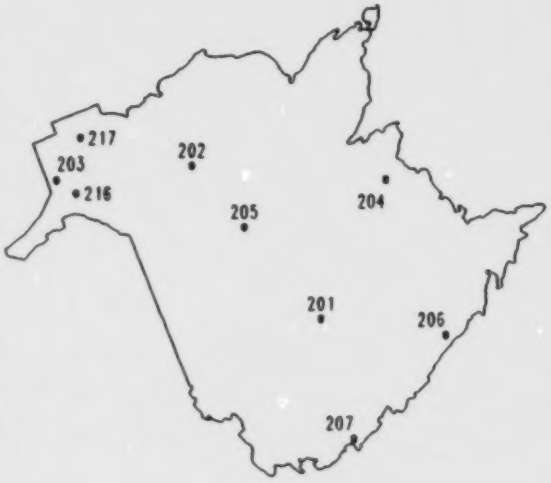
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=215 YEAR=1984



# PLOT NUMBER 216

ARNEWS PLOTS: NEW BRUNSWICK




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 34 | 16.5 | 20.3 | 14.2 |
| spruce | 9 | 20.3 | 7.9 | 15.4 |
| red maple | 1 | 19.9 | 0.7 | 12.0 |
| white birch | 9 | 12.4 | 2.8 | 11.6 |
| totals and averages: | 53 | 16.5 | 31.8 | 13.9 |
| standing dead trees: | 5 | | | |

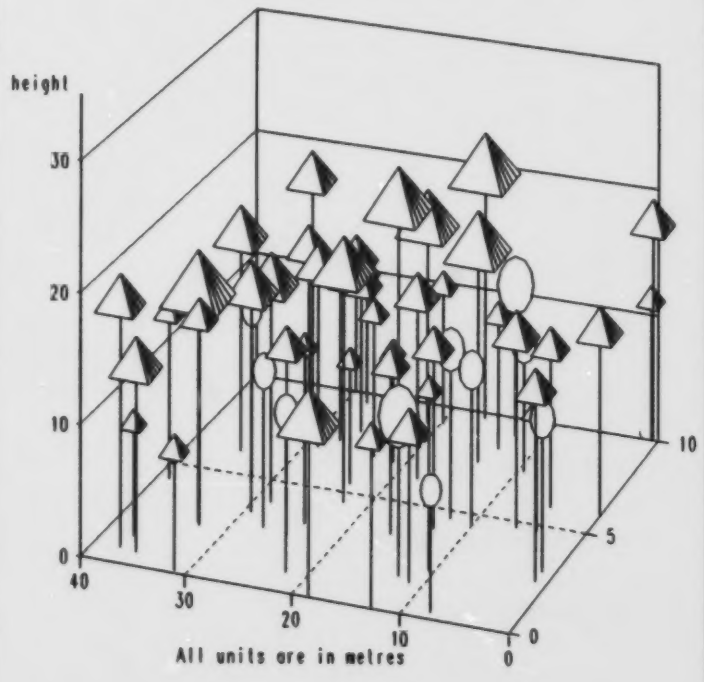
Albert Brook, Madawaska County

UTM: 19 563 5259

An uneven-aged natural stand of fir-spruce cover type in the Edmundston district of the Restigouche-Bras d'Or ecoregion (sugar maple-hemlock-pine zone). The plot has an elevation of 340 m. This plot was established in 1985 with the cooperation of Fraser Inc.

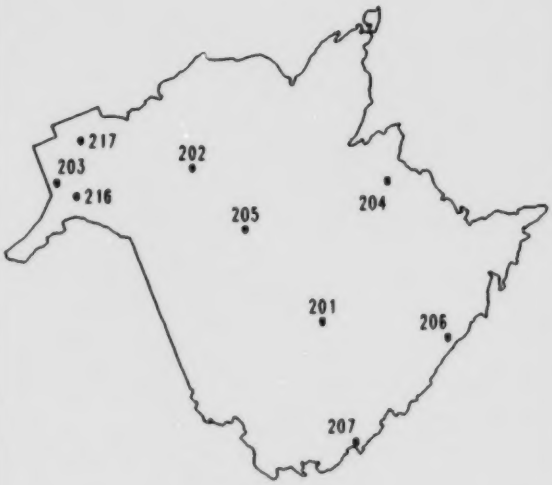
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=216 YEAR=1985



# PLOT NUMBER 217

ARNEWS PLOTS: NEW BRUNSWICK




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 72 | 13.5 | 27.2 | 12.7 |
| red spruce | 24 | 15.5 | 11.8 | 13.3 |
| red maple | 1 | 13.4 | 0.3 | 19.0 |
| white birch | 2 | 11.9 | 0.5 | 11.7 |
| totals and averages: | 99 | 14.0 | 39.9 | 12.9 |
| standing dead trees: | 8 | | | |

Horne's Gulch Airstrip, Restigouche Co.

UTM: 19 581 5298

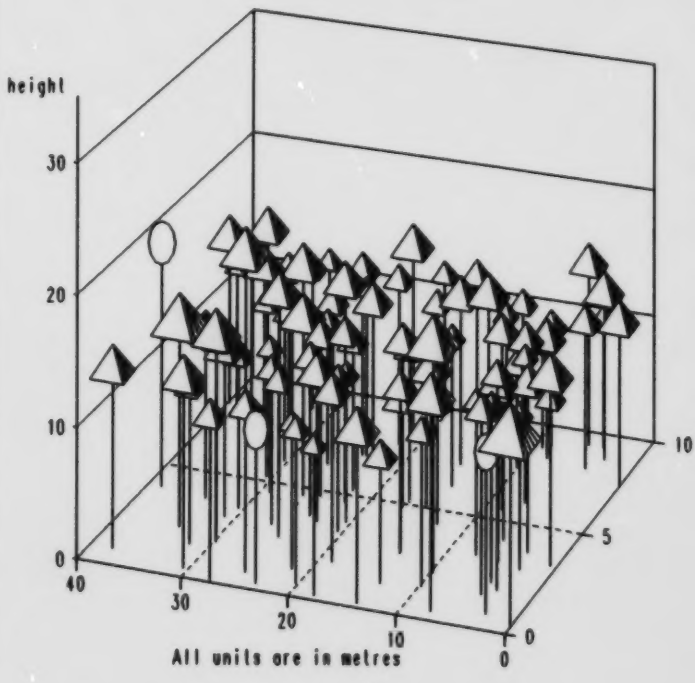
An uneven-aged natural stand of balsam fir-red spruce cover type in the Green River district of the Gaspé-Cape Breton ecoregion (fir-pine-birch zone).

The plot has an elevation of 340 m.

Established in 1985 with the cooperation of Fraser Inc.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=217 YEAR=1985



## Laurentian Region ARNEWS Plots

*D. Lachance*

Twenty-five plots within the ARNEWS system were established in Québec; 13 in 1984 and 12 in 1985. All of these plot locations are officially registered and reserved as "experimental areas" with the Québec Department of Energy and Resources, Research and Development Directorate.

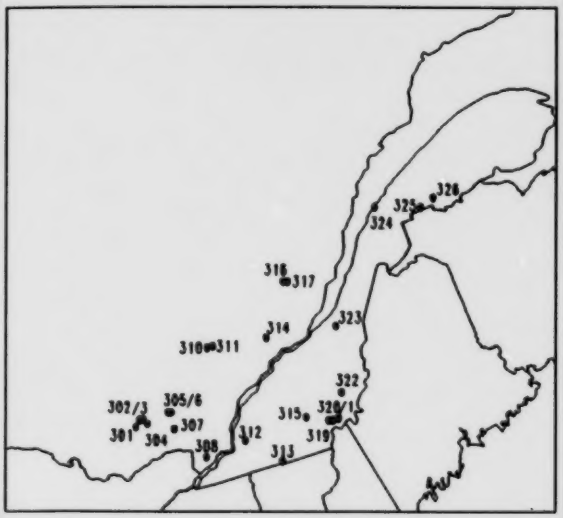
The majority of the plots were located on provincial or institutional lands to provide good long-term protection. However, in order to cover tree species of economic importance or of national distribution, for example white spruce, we established on plot on a private woodlot. Unfortunately the lot was sold for land development two years later and the plot cut down. We have not been able to replace it so far; the region is, therefore, short on white spruce as a monitored tree species.

The first round of soil and foliage sampling and analysis has been staggered over five years, at the rate of five plots per year.

The description of the 24 Laurentian Region ARNEWS plots follow.

# PLOT NUMBER 301

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 6 | 19.0 | 4.4 | 14.7 |
| red maple | 1 | 18.2 | 0.6 | 14.0 |
| sugar maple | 9 | 27.4 | 14.1 | 19.2 |
| yellow birch | 8 | 24.9 | 10.4 | 18.1 |
| totals and averages: | 24 | 24.1 | 29.6 | 17.5 |
| standing dead trees: | 1 | | | |

Lac Misérable, Réserve faunique de Papineau-Labelle, District régional de Labelle

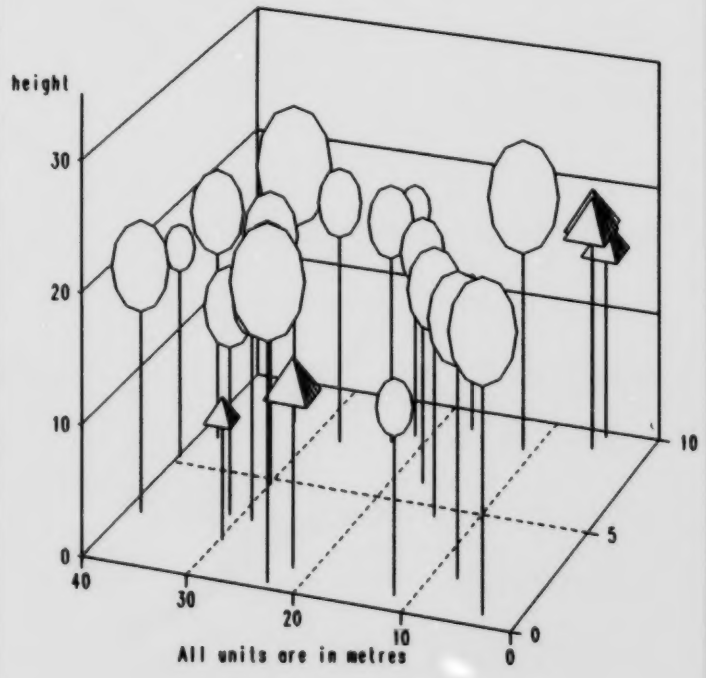
UTM: 18 47 511

An even-aged maple stand located in the ecological region "Basses Laurentides de la Mauricie". The plot faces west with a slope of 10% and is at an elevation of 360 m.

Established on August 2, 1985.

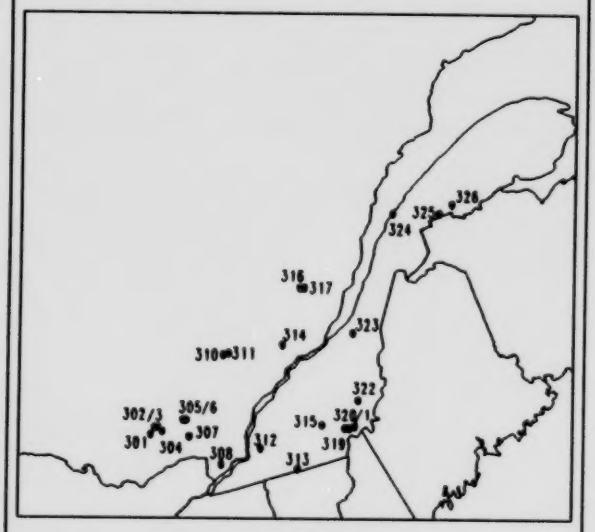
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=301 YEAR=1985



# PLOT NUMBER 302

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 7 | 13.6 | 2.7 | 15.4 |
| yellow birch | 13 | 14.6 | 5.9 | 16.7 |
| American beech | 15 | 20.2 | 12.7 | 16.3 |
| totals and averages: | 35 | 16.8 | 21.3 | 16.3 |
| standing dead trees: | 0 | | | |

Lac des Sept Frères, Réserve faunique de Papineau - Labelle

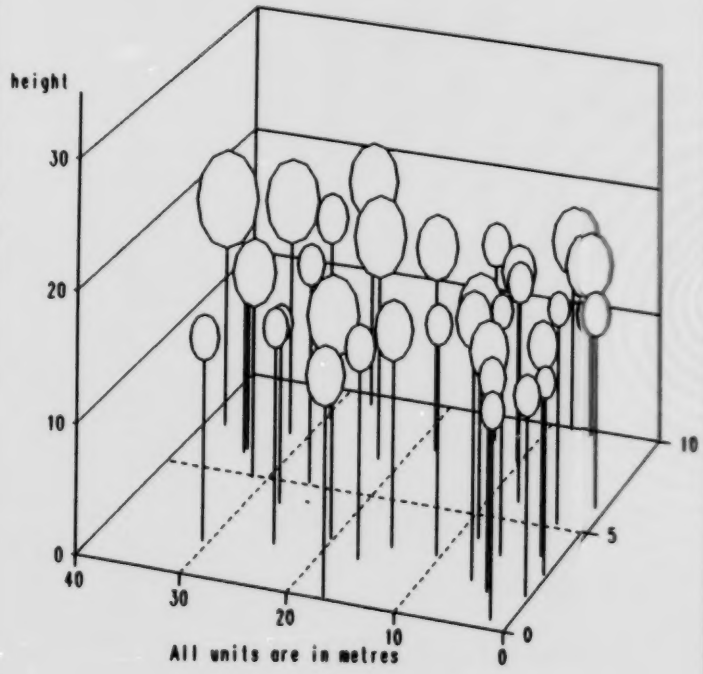
UTM: 18 48 512

A natural even-aged hardwood stand at pole stage located in the ecological region "Basses Laurentides de la Mauricie". The plot faces northwest with a slope of 5% and is at an elevation of 305 m.

Established on August 10, 1985.

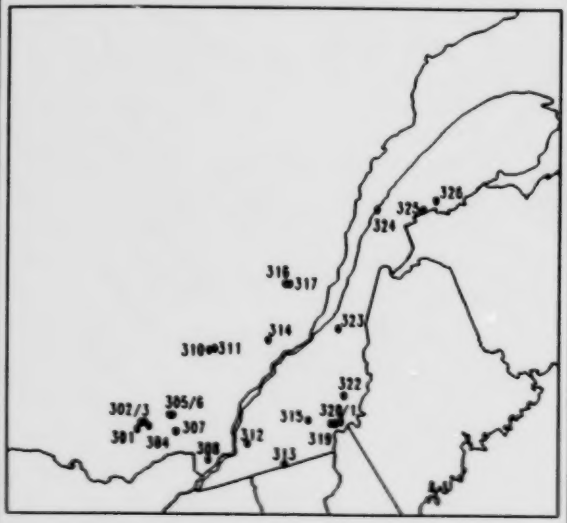
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=302 YEAR=1985



# PLOT NUMBER 303

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 19 | 19.9 | 15.7 | 18.3 |
| sugar maple | 18 | 19.0 | 14.1 | 17.6 |
| yellow birch | 3 | 11.6 | 0.7 | 16.1 |
| American beech | 1 | 15.4 | 0.4 | 15.5 |
| rough-barked ironwood | 1 | 14.3 | 0.4 | 17.0 |
| American basswood | 1 | 12.6 | 0.3 | 16.5 |
| totals and averages: | 43 | 18.6 | 31.8 | 17.7 |
| standing dead trees: | 2 | | | |

Lac des Sept Frères, Réserve faunique de Papineau – Labelle, District régional de Labelle

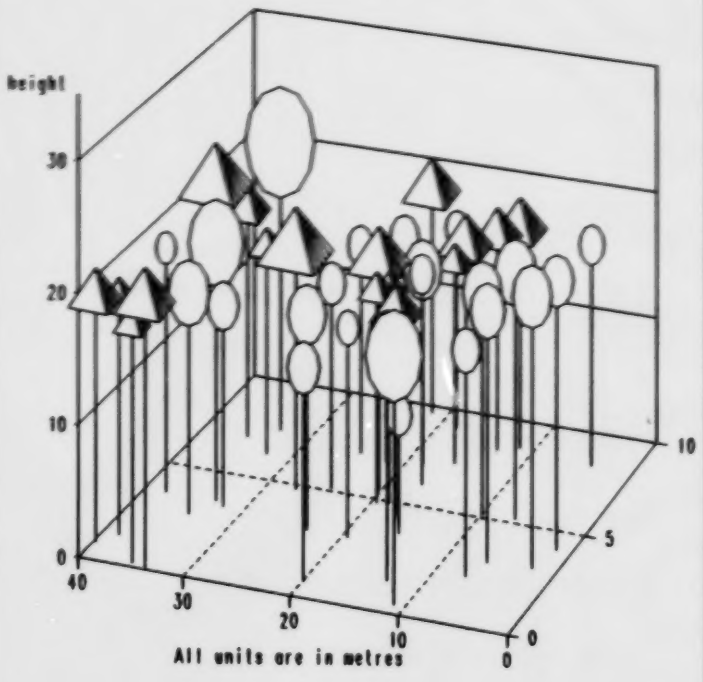
UTM: 18 48 512

An even-aged maple stand at pole stage located in the ecological region "Basses Laurentides de la Mauricie".

The plot faces northeast with a slope of 5% and is at an elevation of 300 m.

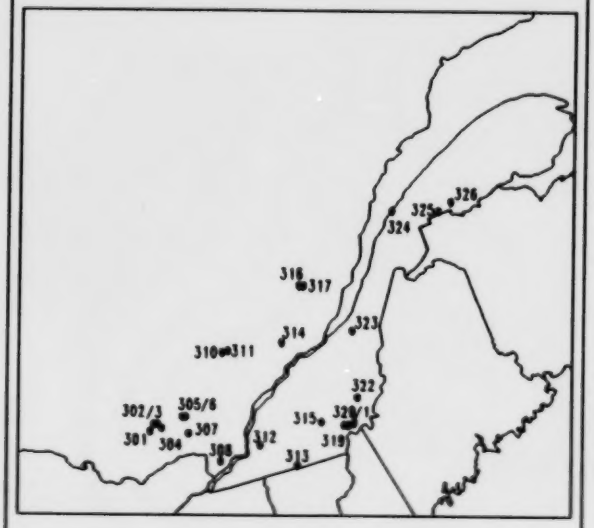
Established on October 2, 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=303 YEAR=1985



# PLOT NUMBER 304

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| red spruce | 24 | 17.6 | 16.9 | 13.4 |
| eastern white pine | 14 | 21.4 | 13.8 | 16.7 |
| eastern hemlock | 1 | 29.4 | 1.6 | 12.0 |
| white birch | 1 | 12.1 | 0.2 | 14.5 |
| totals and averages: | 40 | 19.1 | 32.7 | 14.5 |
| standing dead trees: | 4 | | | |

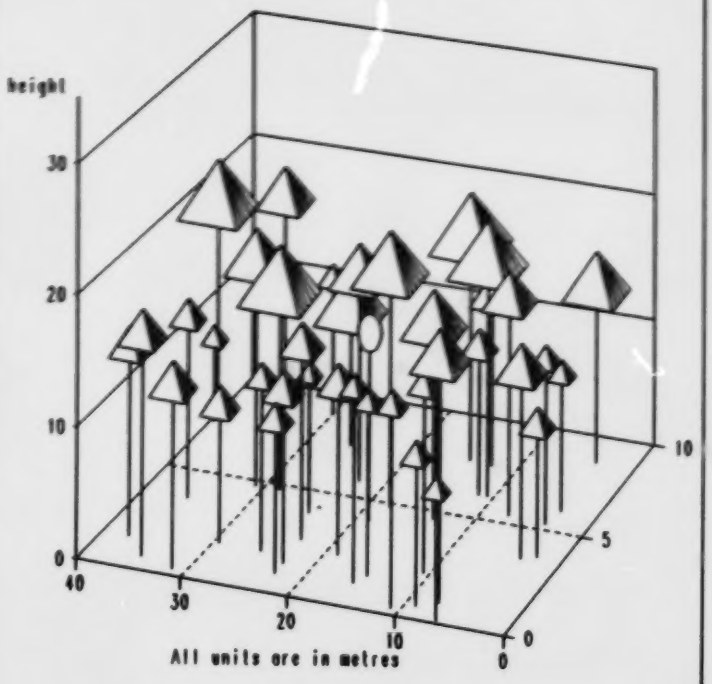
Lac aux Castors, Réserve faunique de Papineau-Labelle, District régional de Labelle

UTM: 18 49 511

An even-aged stand of the red spruce-white pine cover type at pole stage located in the ecological region "Lac Nomininque". The plot faces west with a slope of 10% and is at an elevation of 275 m. Established on October 8, 1985.

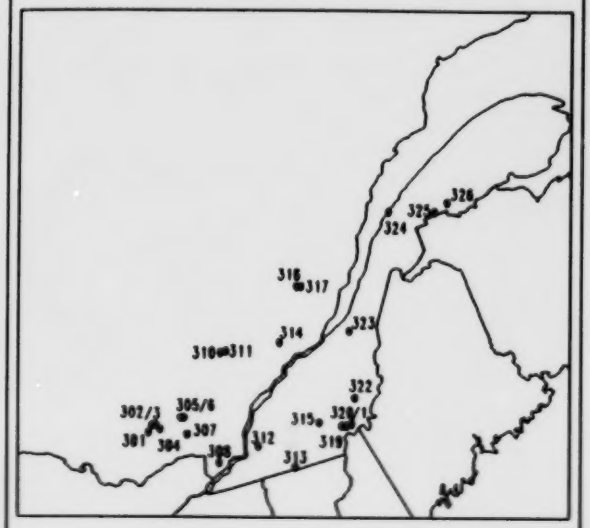
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=304 YEAR=1985



# PLOT NUMBER 305

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| red spruce | 67 | 14.9 | 30.7 | 12.7 |
| eastern white pine | 3 | 34.0 | 7.4 | 18.3 |
| totals and averages: | 70 | 15.7 | 38.2 | 12.9 |
| standing dead trees: | 1 | | | |

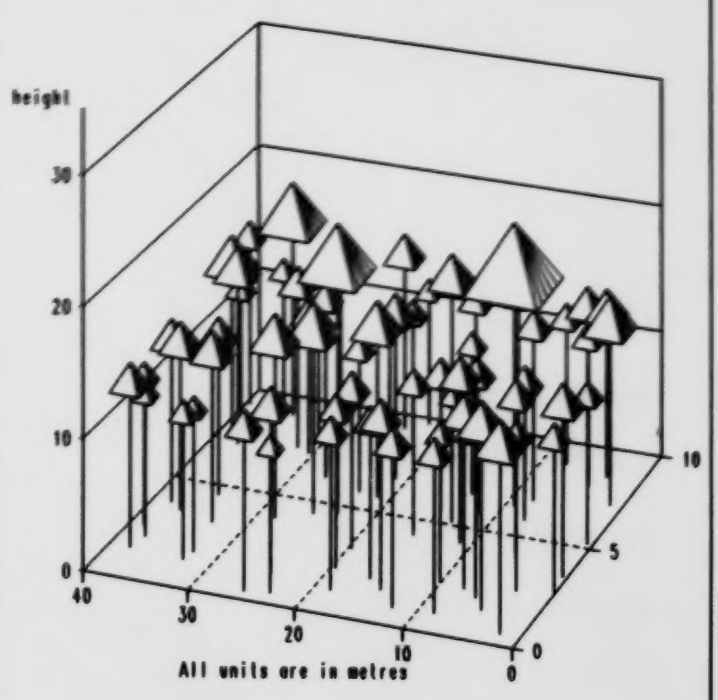
Lac Tremblant, Parc Provincial du Mont-Tremblant, District régional de Terrebonne

UTM: 18 53 512

An even-aged red spruce stand at pole stage located in the ecological region "Moyennes Laurentides de la Mauricie". In 1986, the trees averaged 63-years-old. The plot faces west with a slope of 10% and is at an elevation of 305 m.

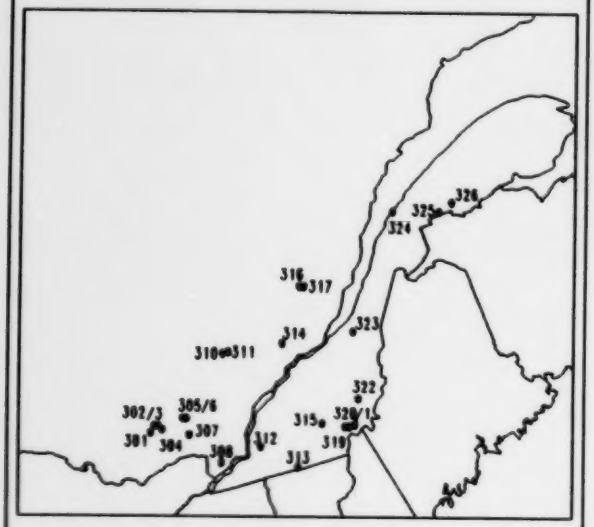
Established on July 16, 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=305 YEAR=1985



# PLOT NUMBER 306

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 20 | 13.5 | 7.5 | 10.5 |
| sugar maple | 1 | 10.7 | 0.2 | 12.0 |
| yellow birch | 25 | 26.5 | 41.5 | 17.2 |
| totals and averages: | 46 | 20.5 | 49.2 | 14.1 |
| standing dead trees: | 2 | | | |

Lac du Chat, Parc Provincial du Mont-Tremblant, District régional de Montcalm

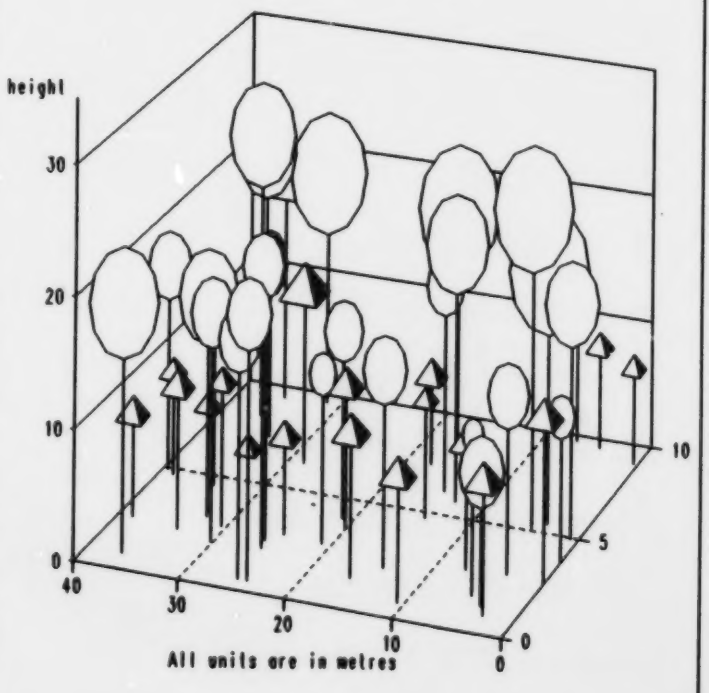
UTM: 18 53 512

A natural two-storied stand of yellow birch and balsam fir located in the ecological region "Moyenres Laurentides de la Mauricie". The plot faces west with a slope of 15% and is at an elevation of 366 m.

Established on July 17, 1985.

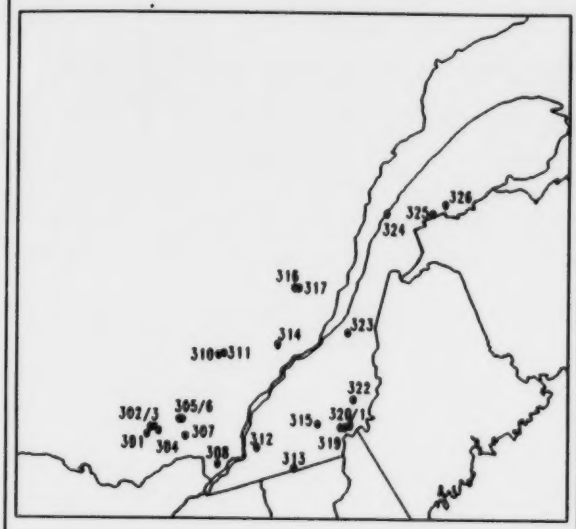
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=306 YEAR=1985



# PLOT NUMBER 307

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 13 | 14.4 | 5.9 | 11.6 |
| red spruce | 4 | 23.1 | 4.4 | 16.5 |
| eastern hemlock | 1 | 46.2 | 4.1 | 21.0 |
| striped maple | 1 | 10.8 | 0.2 | 7.5 |
| red maple | 8 | 25.8 | 10.5 | 19.9 |
| yellow birch | 4 | 30.4 | 7.5 | 19.1 |
| totals and averages: | 31 | 21.4 | 32.9 | 15.5 |
| standing dead trees: | 0 | | | |

C.E.F. des Laurentides, Saint-Faustin,

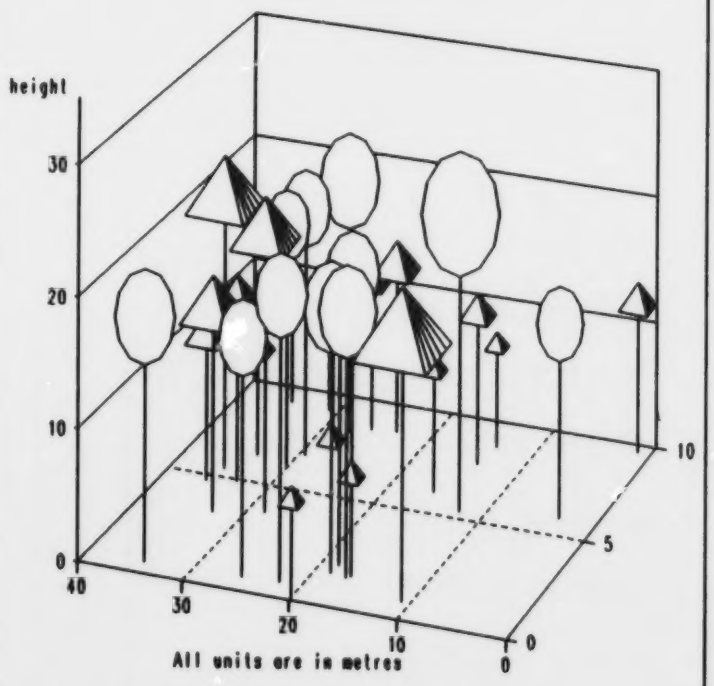
District regional de Terrebonne

UTM: 18 53 509

An uneven-aged mature stand located in the ecological region "Basses Laurentides de la Mauricie". The plot faces northwest with a slope of 5 to 10% and is at an elevation of 366 m. Established on July 18, 1985.

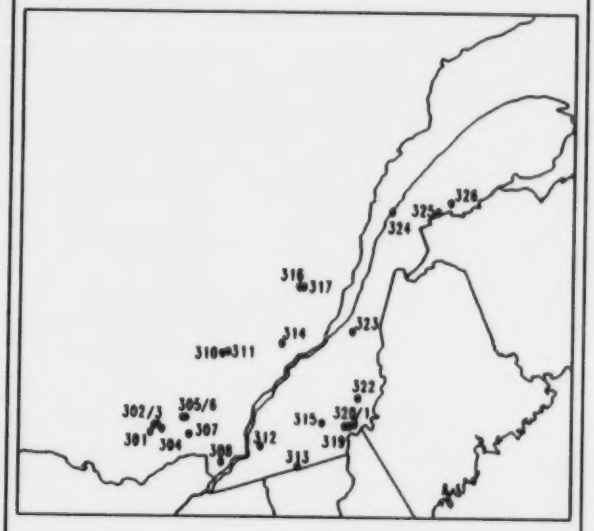
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=307 YEAR=1985



# PLOT NUMBER 308

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 12 | 13.0 | 4.2 | 15.2 |
| American beech | 1 | 10.4 | 0.2 | 14.5 |
| rough-barked ironwood | 3 | 14.2 | 1.2 | 15.5 |
| largetooth aspen | 3 | 24.4 | 3.6 | 20.5 |
| red oak | 19 | 27.0 | 29.0 | 21.1 |
| totals and averages: | 38 | 20.9 | 38.3 | 18.6 |
| standing dead trees: | 5 | | | |

Oka, Parc Paul-Sauve, District régional des Deux - Montagnes

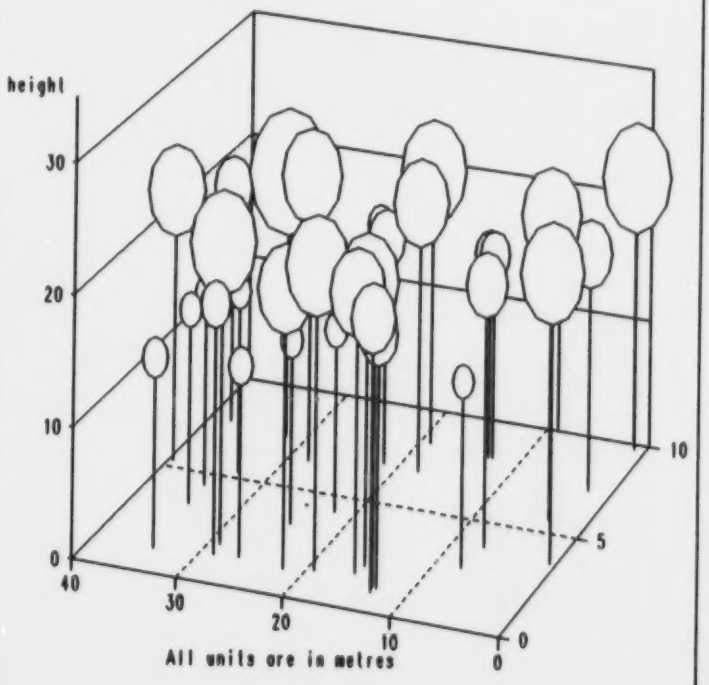
UTM: 18 57 503

An uneven-aged mature stand located in the ecological region "Montréal et Haut-Richelieu". The plot faces south with a slope of 15% and is at an elevation of 120 m.

Established on October 16, 1984.

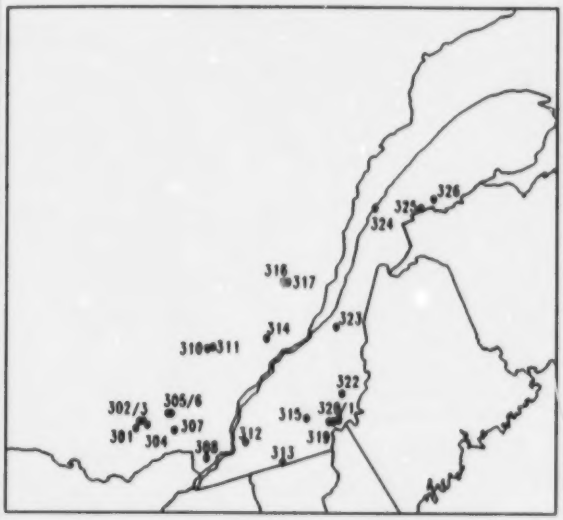
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=308 YEAR=1984



# PLOT NUMBER 310

AR EWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| black spruce | 4 | 11.2 | 1.0 | 11.1 |
| jack pine | 75 | 15.4 | 37.2 | 16.9 |
| totals and averages: | 79 | 15.2 | 38.2 | 16.6 |
| standing dead trees: | 12 | | | |

Lac Baude, Réserve faunique du St-Maurice

District régional de Champlain

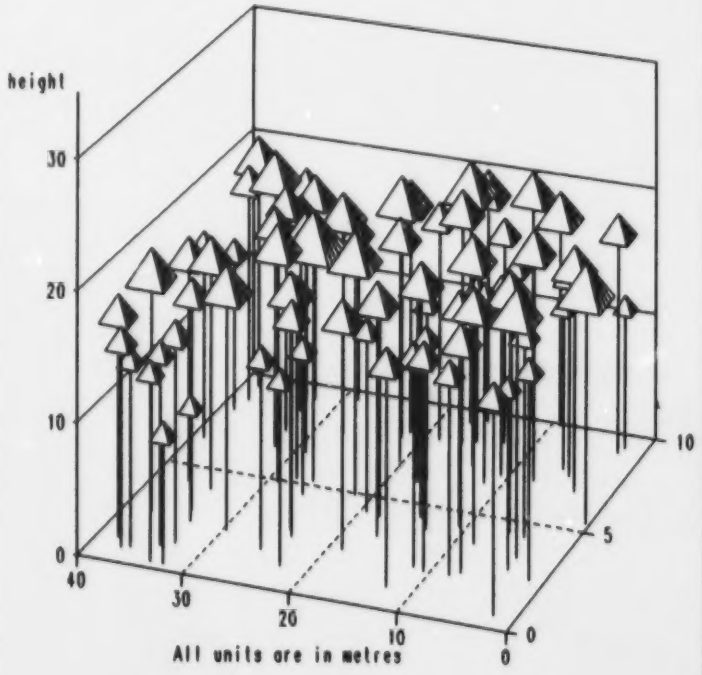
UTM: 18 62 521

A natural even-aged jack pine stand at pole stage located in the ecological region "Réservoir Cabonga". In 1986, the trees averaged 54-years-old. The plot faces south with a slope of 5% and is at an elevation of 410 m.

Established on October 16, 1984.

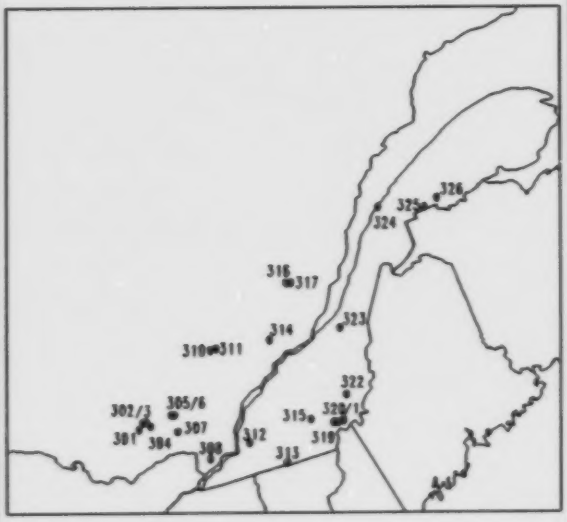
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=310 YEAR=1984



# PLOT NUMBER 311

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| black spruce | 1 | 11.8 | 0.2 | 11.0 |
| jack pine | 70 | 13.9 | 27.8 | 16.6 |
| totals and averages: | 71 | 13.9 | 28.1 | 16.5 |
| standing dead trees: | 3 | | | |

Lac Baude, District régional de Champlain

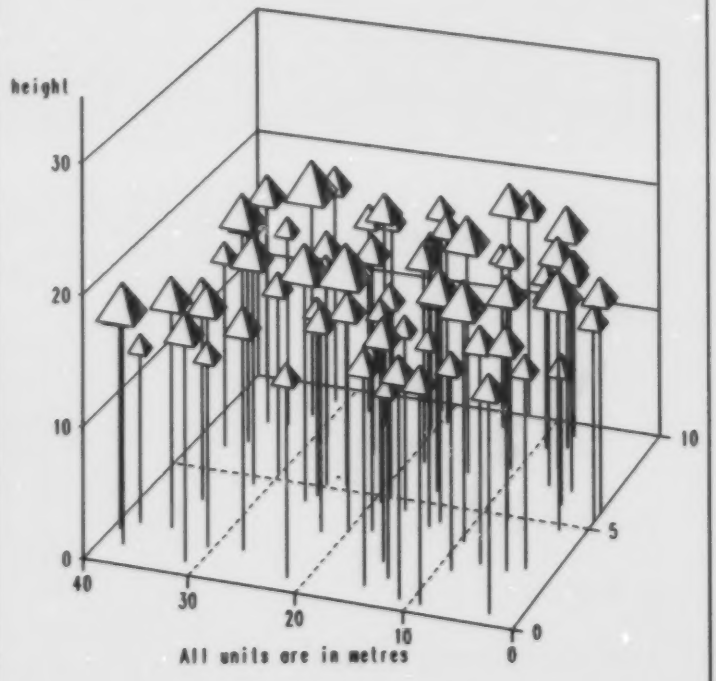
UTM: 18 63 521

An even-aged jack pine stand located in the ecological region "Réservoir Cabonga" In 1986, the trees averaged 53-years-old. The plot faces west with a slope of 5% and is at an elevation of 400 m.

Established on October 17, 1984.

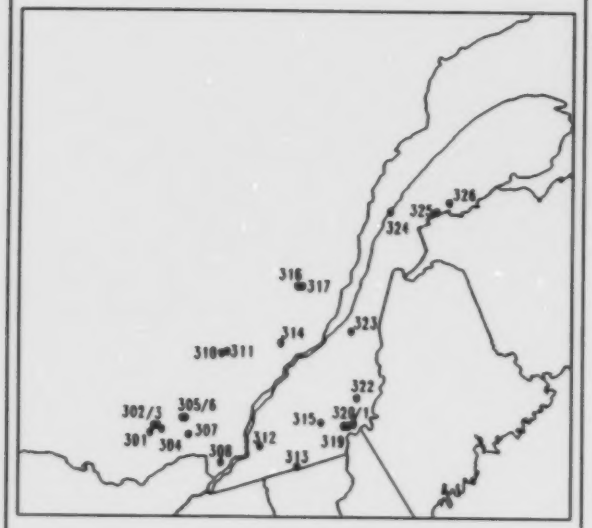
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=311 YEAR=1984



# PLOT NUMBER 312

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

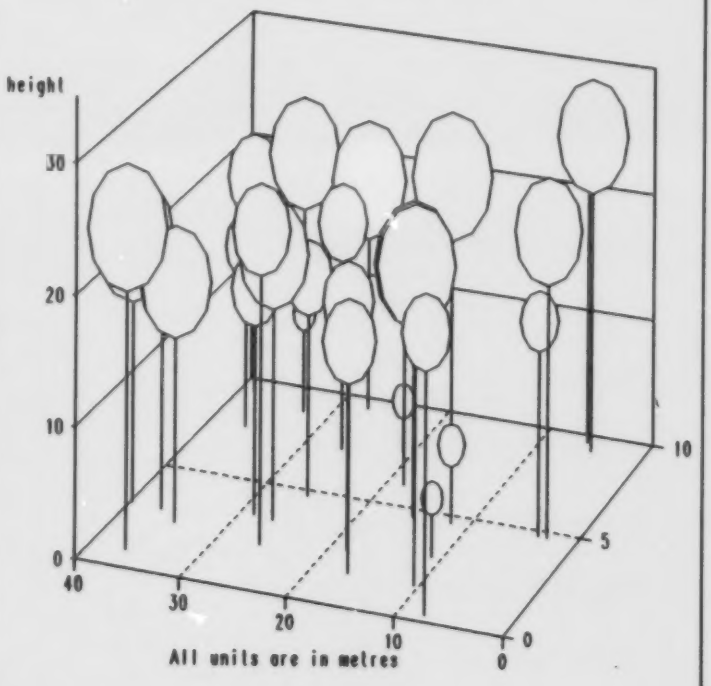
| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 15 | 21.7 | 15.9 | 15.2 |
| white ash | 2 | 25.8 | 2.6 | 20.7 |
| red oak | 10 | 36.0 | 26.2 | 20.2 |
| American basswood | 2 | 29.5 | 3.5 | 20.7 |
| totals and averages: | 29 | 27.5 | 48.4 | 17.7 |
| standing dead trees: | 2 | | | |

Mont St-Hilaire, District régional de Rouville

UTM: 18 64 504

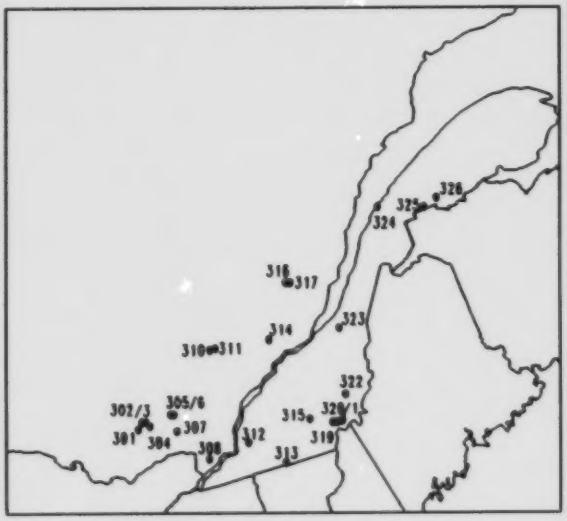
An uneven-aged mature stand composed of sugar maple and red oak located in the ecological region "Rivière Richelieu". In 1986, the trees averaged 140-years-old. The plot faces west with a slope of 20% and is at an elevation of 270 m. Established on June 19, 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=312 YEAR=1985



# PLOT NUMBER 313

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 8 | 25.0 | 10.1 | 17.2 |
| yellow birch | 14 | 17.4 | 8.7 | 15.7 |
| black cherry | 14 | 17.1 | 8.6 | 16.2 |
| totals and averages: | 36 | 19.0 | 27.5 | 16.2 |
| standing dead trees: | 2 | | | |

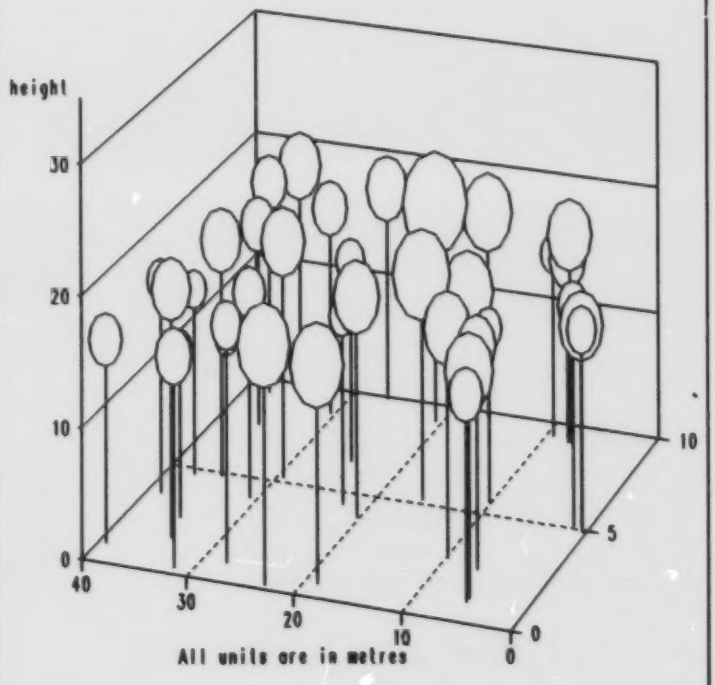
Mont Sutton, District régional de Brome

UTM: 18 69 499

A natural even-aged stand composed of yellow birch, cherry, and sugar maple located in the ecological region "Sherbrooke". In 1985, the trees averaged 44-years-old. The plot faces southwest with a slope of 15% and is at an elevation of 455 m. Established on July 31, 1985.

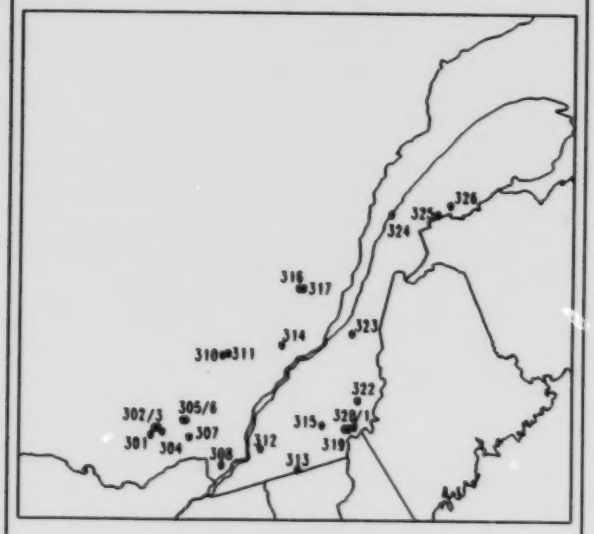
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=313 YEAR=1985



# PLOT NUMBER 314

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| red spruce | 2 | 28.7 | 3.2 | 21.2 |
| sugar maple | 18 | 25.0 | 26.1 | 20.3 |
| American beech | 1 | 50.1 | 4.9 | 21.0 |
| totals and averages: | 21 | 26.5 | 34.3 | 20.4 |
| standing dead trees: | 1 | | | |

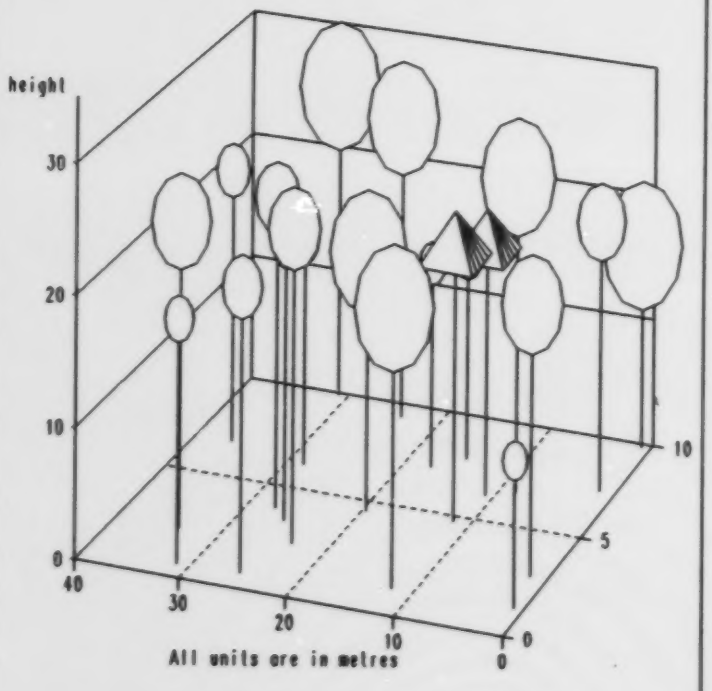
Perthuis, District régional de Portneuf

UTM: 18 72 520

An uneven-aged maple stand located in the ecological region "Moyennes Laurentides de la Mauricie". In 1986, the trees averaged 72-years-old. The plot faces northwest with a slope of 10% and is at an elevation of 275 m. Established on August 1, 1985.

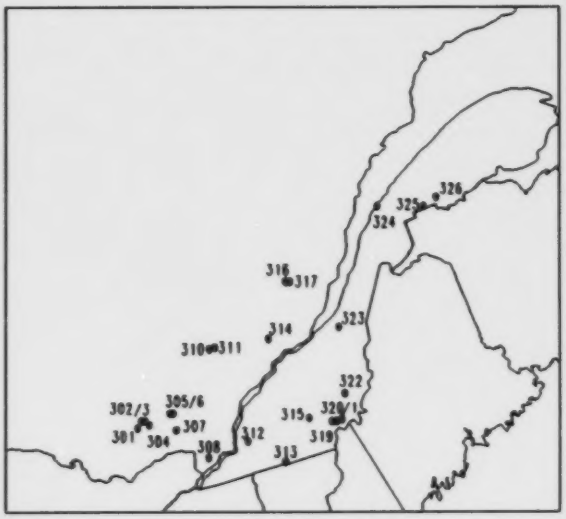
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=314 YEAR=1985



# PLOT NUMBER 315

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| red maple | 1 | 28.3 | 1.5 | 24.5 |
| sugar maple | 15 | 25.7 | 23.3 | 20.3 |
| American beech | 6 | 27.4 | 10.4 | 20.5 |
| white ash | 6 | 33.0 | 13.0 | 24.6 |
| totals and averages: | 28 | 27.7 | 48.3 | 21.4 |
| standing dead trees: | 0 | | | |

Dudswell, District régional de Wolfe

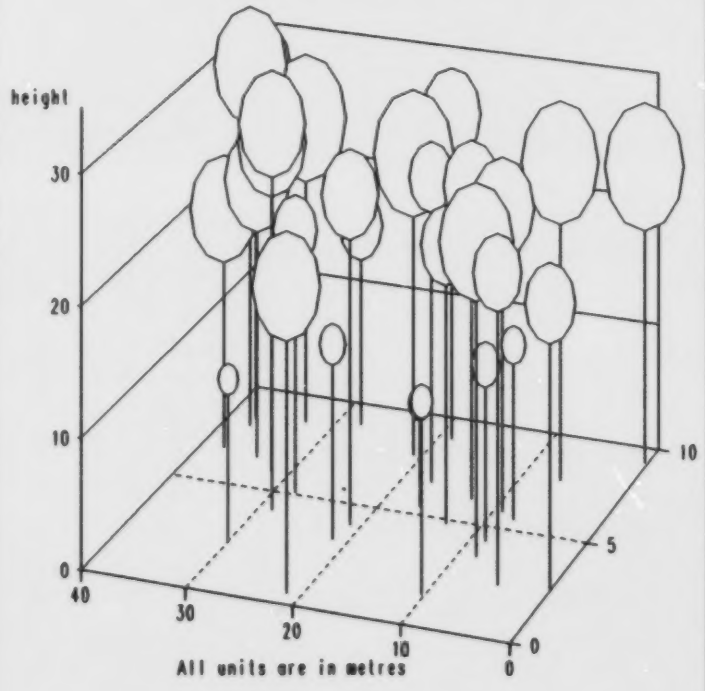
UTM: 19 28 505

A natural uneven-aged stand composed of sugar maple, beech, and white ash located in the ecological region "Sherbrooke". The plot faces east with a slope of 8% and is at an elevation of 310 m.

Established on September 26, 1984.

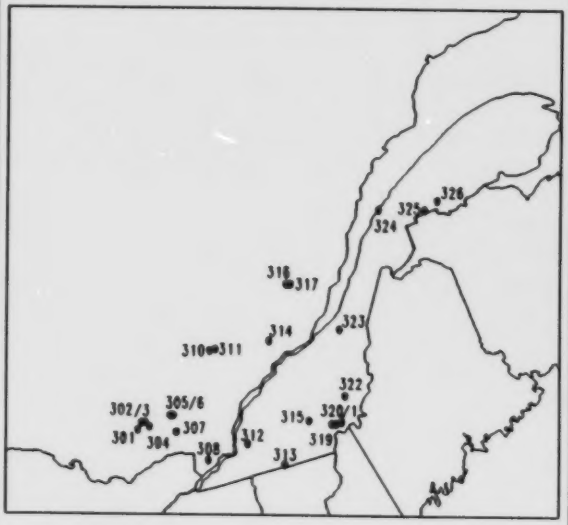
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=315 YEAR=1984



# PLOT NUMBER 316

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 7 | 15.6 | 3.5 | 13.3 |
| black spruce | 49 | 17.7 | 32.4 | 13.2 |
| totals and averages: | 56 | 17.4 | 36.0 | 13.2 |
| standing dead trees: | 10 | | | |

Riviere Pikauba, District régional de Montmorency # 1

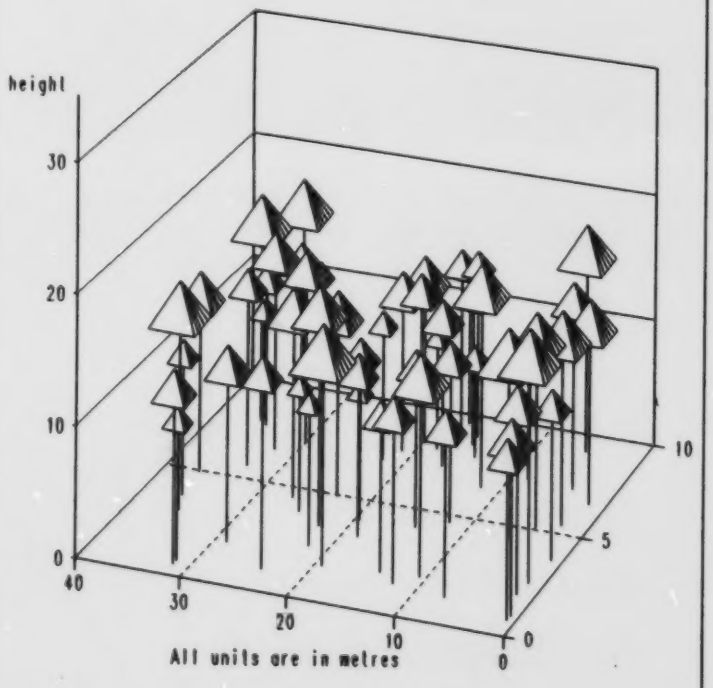
UTM: 19 33 528

An even-aged black spruce stand with balsam fir at pole stage located in the ecological region "Hautes Laurentides de la Riviere Malbaie". In 1985, the trees averaged 70-years-old. The plot faces east with a slope of 5% and is at an elevation of 790 m.

Established on October 24, 1984.

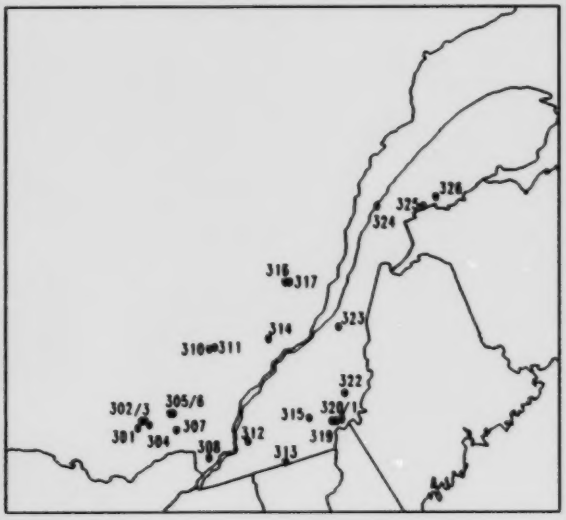
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=316 YEAR=1984



# PLOT NUMBER 317

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 2 | 16.2 | 1.0 | 15.5 |
| black spruce | 38 | 23.7 | 44.6 | 15.1 |
| totals and averages: | 40 | 23.3 | 45.6 | 15.1 |
| standing dead trees: | 5 | | | |

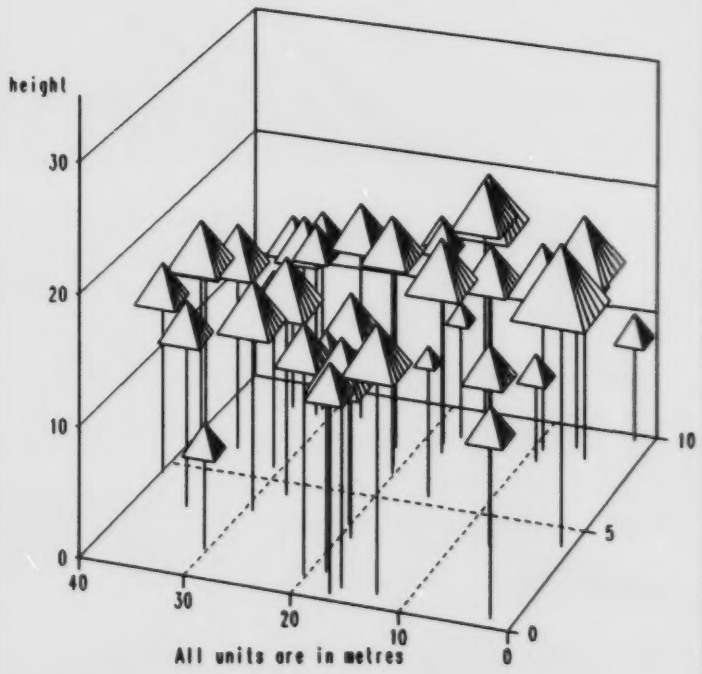
Rivière Pikauba, District régional de Montmorency # 1

UTM: 19 33 528

A natural even-aged black spruce stand located in the ecological region "Hautes Laurentides de la Rivière Malbaie". In 1985, the trees averaged 70-years-old. The plot faces northwest with a slope of 5% and is at an elevation of 850 m. Established on October 4, 1984.

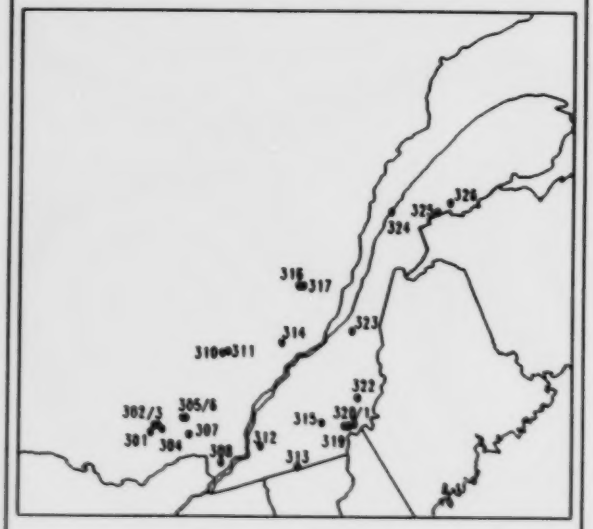
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=317 YEAR=1984



# PLOT NUMBER 319

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 22 | 25.1 | 30.7 | 20.5 |
| yellow birch | 1 | 21.5 | 0.9 | 24.5 |
| American beech | 1 | 15.8 | 0.4 | 10.5 |
| totals and averages: | 24 | 24.6 | 32.1 | 20.2 |
| standing dead trees: | 0 | | | |

Mont Mégantic, District régional de Frontenac

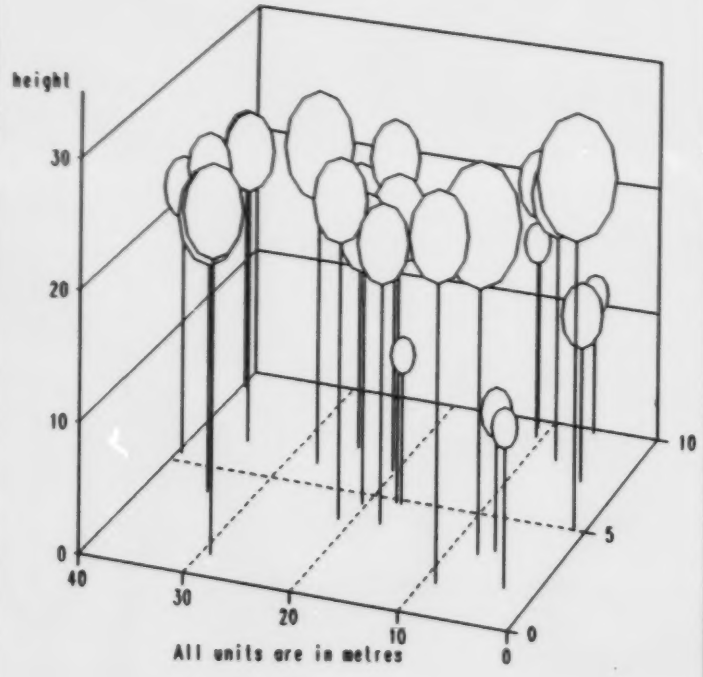
UTM: 19 32 503

An uneven-aged maple stand located in the ecological region "Collines de Mégantic, lacs Etchemin et Squatec". In 1985, the trees averaged 70-years-old. The plot faces west with a slope of 15% and is at an elevation of 500 m.

Established on October 29, 1984.

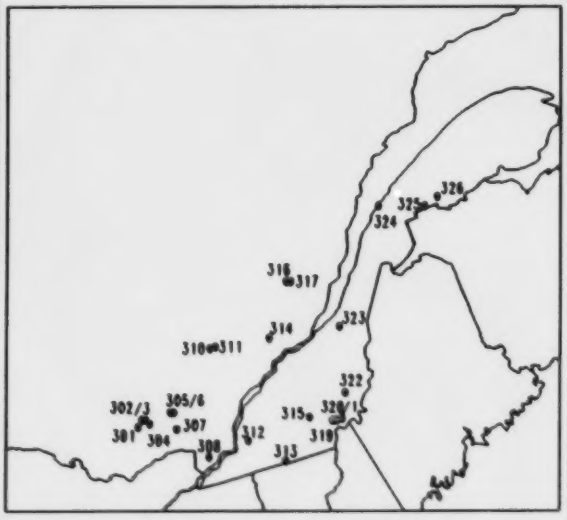
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=319 YEAR=1984



# PLOT NUMBER 320

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 1 | 10.8 | 0.2 | 8.0 |
| red spruce | 21 | 16.8 | 12.6 | 11.5 |
| striped maple | 1 | 14.5 | 0.4 | 10.5 |
| red maple | 2 | 15.6 | 0.9 | 12.5 |
| white birch | 30 | 19.7 | 23.8 | 14.7 |
| totals and averages: | 55 | 18.2 | 38.1 | 13.2 |
| standing dead trees: | 6 | | | |

Mont Mégantic, District régional de Frontenac

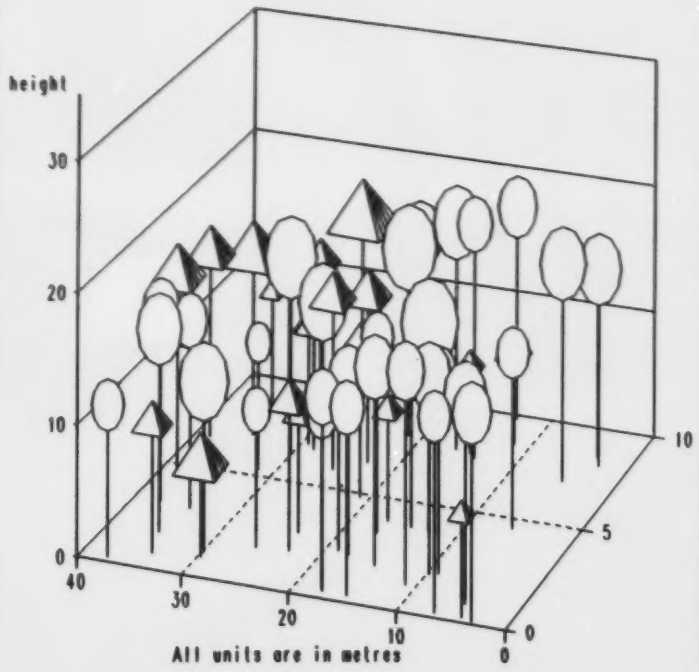
UTM: 19 32 503

A natural even-aged stand of white birch and red spruce located in the ecological region "Collines de Mégantic, lacs Etchemin et Squatec". In 1985, the trees averaged 72-years-old. The plot faces south with a slope of 10% and is at an elevation of 550 m.

Established on October 29, 1984.

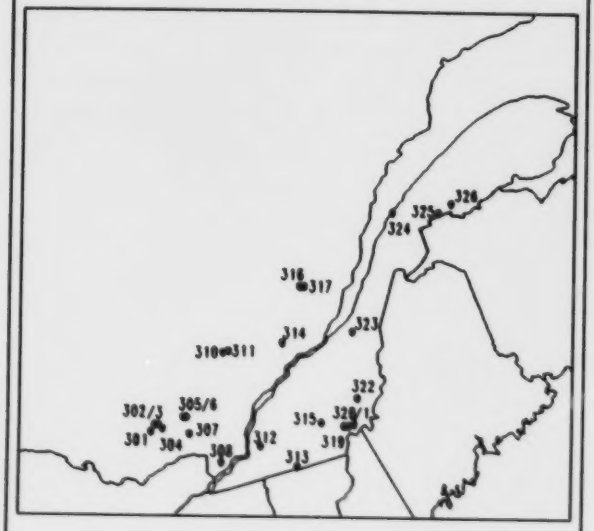
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=320 YEAR=1984



# PLOT NUMBER 321

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 22 | 21.0 | 21.2 | 11.2 |
| white spruce | 2 | 25.9 | 2.8 | 14.2 |
| red spruce | 1 | 10.1 | 0.2 | 3.5 |
| yellow birch | 1 | 37.7 | 2.7 | 14.5 |
| white birch | 11 | 20.7 | 10.1 | 12.3 |
| showy mountain-ash | 2 | 11.6 | 0.5 | 8.5 |
| totals and averages: | 39 | 20.8 | 37.7 | 11.4 |
| standing dead trees: | 6 | | | |

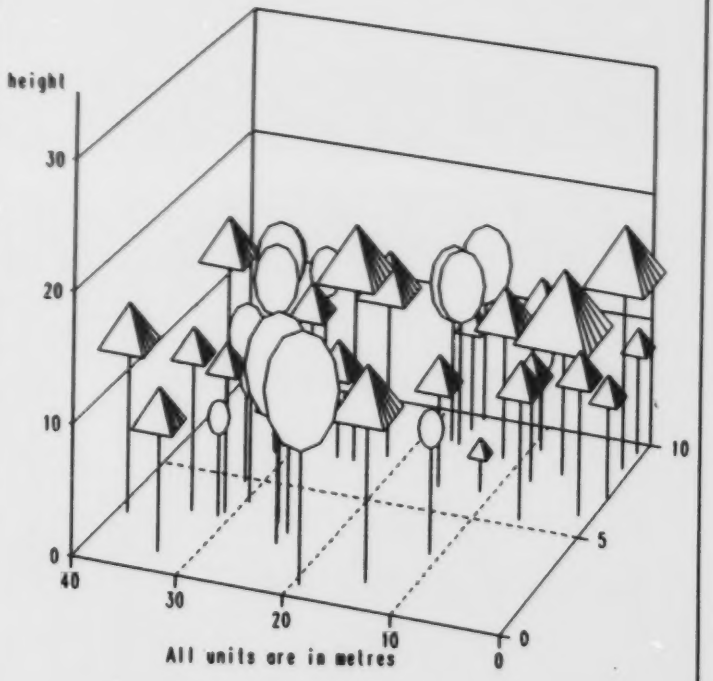
Mont Mégantic, District régional de Frontenac

UTM: 19 33 503

A balsam fir stand with white birch located in the ecological region "Hautes Appalaches". In 1985, the trees averaged 83-years-old. The plot faces west with a slope of 15% and is at an elevation of 900 m.

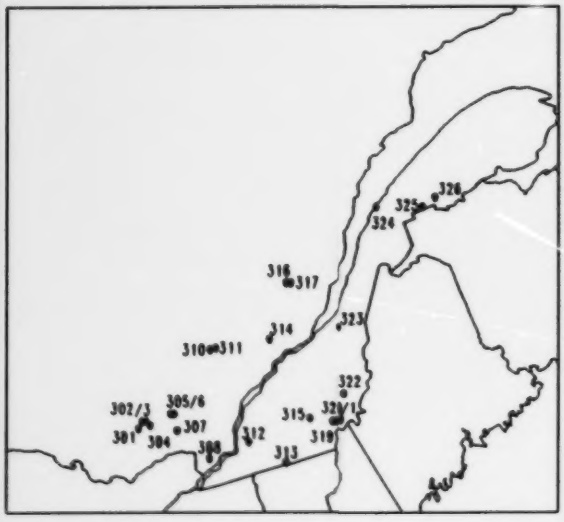
Established on October 30, 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=321 YEAR=1984



# PLOT NUMBER 322

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 19 | 23.1 | 24.6 | 18.2 |
| American beech | 4 | 29.8 | 7.6 | 19.5 |
| totals and averages: | 23 | 24.3 | 32.3 | 18.4 |
| standing dead trees: | 0 | | | |

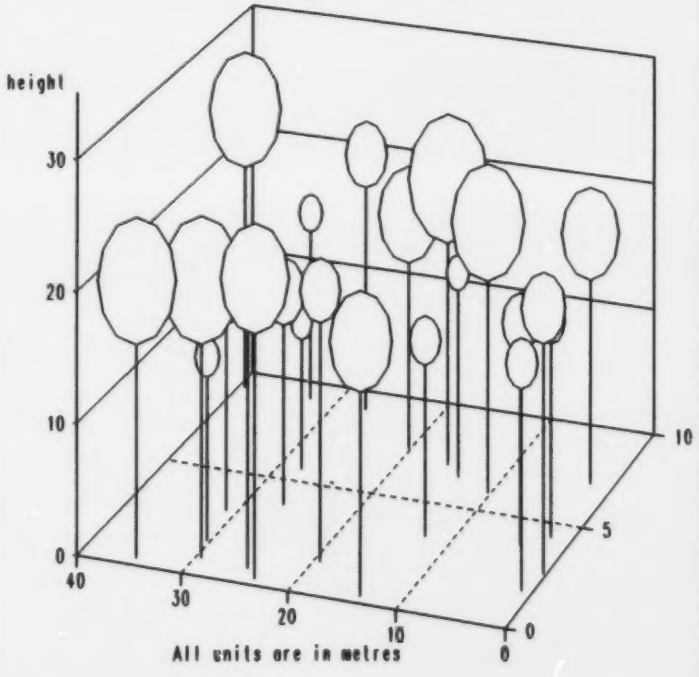
St-Hilaire-de-Dorset, District régional de Frontenac

UTM: 19 35 507

An uneven-aged maple stand located in the ecological region "Beauce". In 1986, the trees averaged 90-years-old. The plot faces north with a slope of 15% and is at an elevation of 520 m. Established on September 26, 1984.

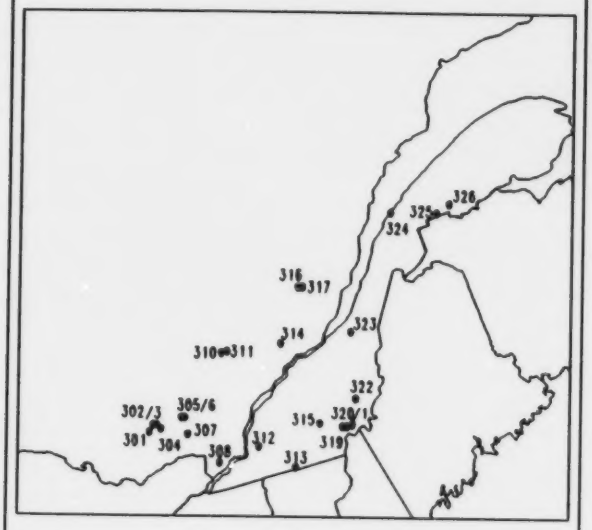
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=322 YEAR=1984



# PLOT NUMBER 323

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 2 | 16.9 | 1.1 | 12.0 |
| red spruce | 60 | 18.4 | 44.4 | 15.0 |
| white birch | 3 | 12.9 | 0.9 | 11.8 |
| largetooth aspen | 3 | 29.1 | 5.1 | 18.1 |
| trembling aspen | 2 | 22.7 | 2.0 | 14.5 |
| totals and averages: | 70 | 18.7 | 53.7 | 14.9 |
| standing dead trees: | 14 | | | |

Armagh, District régional de Montmagny

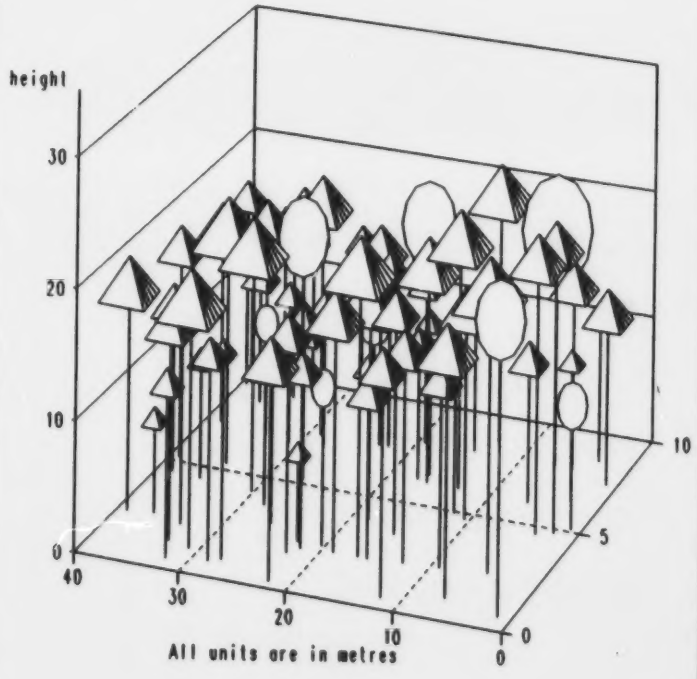
UTM: 19 38 518

A red spruce stand located in the ecological region "Collines de Mégantic, lacs Etchemin et Squatec". In 1986, the trees averaged 70-years-old. The plot is flat and is at an elevation of 355 m.

Established on October 10, 1984.

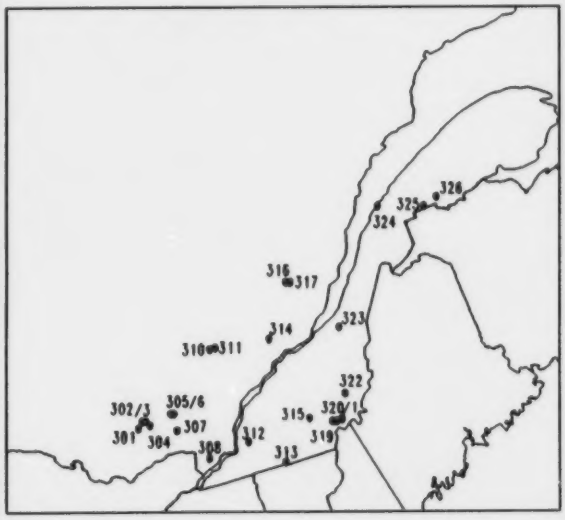
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=323 YEAR=1984



# PLOT NUMBER 324

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| white spruce | 1 | 10.3 | 0.2 | 6.5 |
| red pine | 96 | 16.5 | 53.8 | 11.3 |
| totals and averages: | 97 | 16.4 | 54.0 | 11.2 |
| standing dead trees: | 2 | | | |

Parc du Bic,

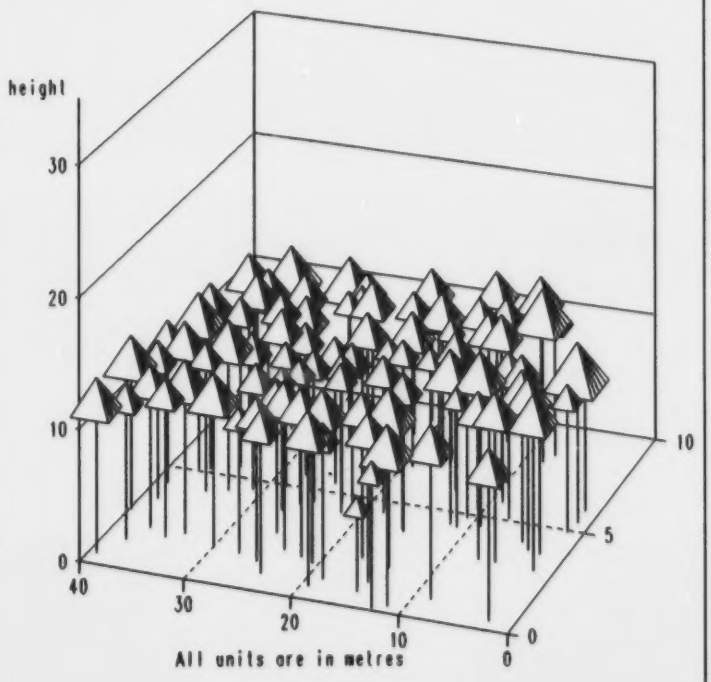
District régional de Rimouski

UTM: 19 51 535

A red pine stand about 100-years-old along the St. Lawrence River located in the ecological region "Rivière-du-Loup". The plot faces south with a slope of 20% and is at an elevation of 170 m. Established on August 6, 1985.

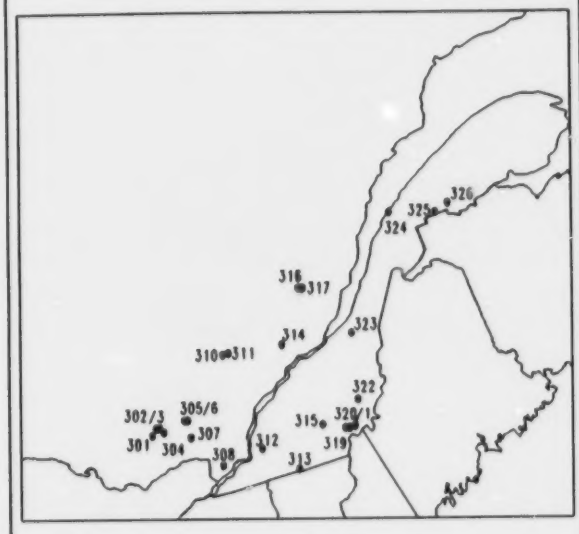
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=324 YEAR=1985



# PLOT NUMBER 325

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 48 | 16.8 | 28.2 | 12.2 |
| white spruce | 8 | 20.5 | 7.2 | 12.6 |
| totals and averages: | 56 | 17.3 | 35.4 | 12.2 |
| standing dead trees: | 5 | | | |

Rivière Patapédia,

District regional de Rimouski

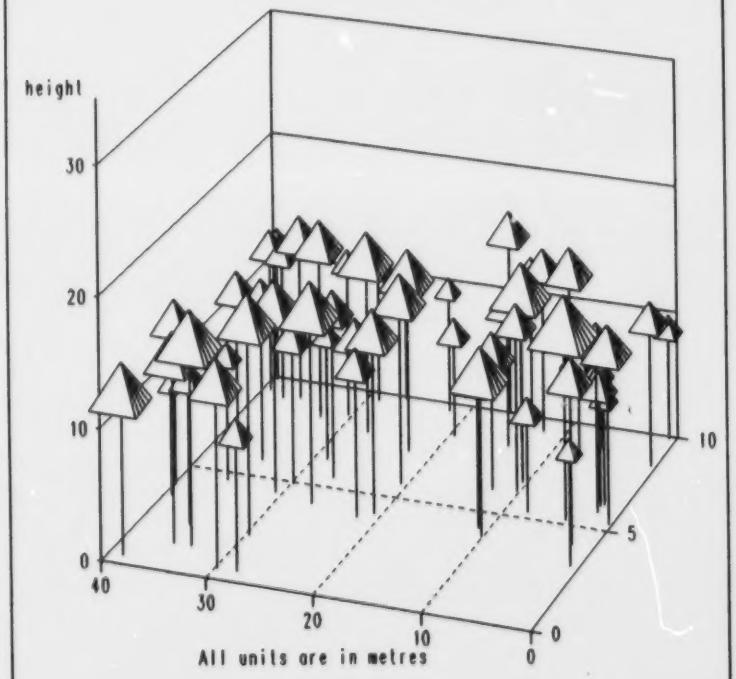
UTM: 19 58 531

A natural even-aged stand composed of balsam fir and white spruce located in the ecological region "Bas et moyens Monts Notre-Dame". The plot faces northeast with a slope of 5% and is at an elevation of 425 m.

Established on July 23, 1985.

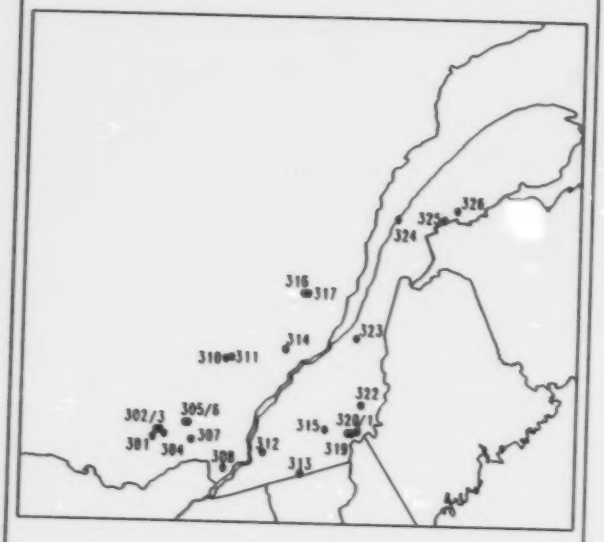
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=325 YEAR=1985



# PLOT NUMBER 326

ARNEWS PLOTS: QUÉBEC




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| black spruce | 114 | 13.7 | 43.4 | 13.7 |
| trembling aspen | 1 | 21.5 | 0.9 | 18.0 |
| totals and averages: | 115 | 13.8 | 44.3 | 13.8 |
| standing dead trees: | 6 | | | |

Albertville, District régional de Bonaventure

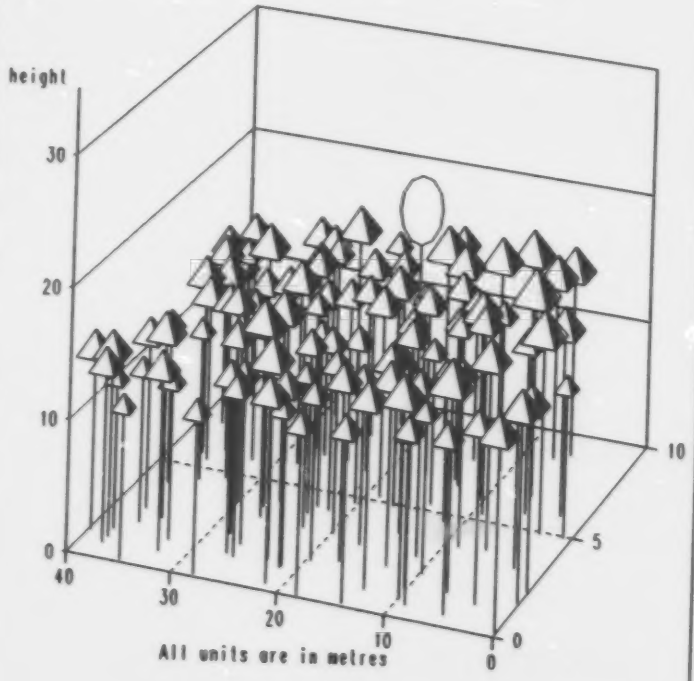
UTM: 19 61 533

A natural even-aged black spruce stand located in the ecological region "Bas et moyens Monts Notre-Dame". The plot faces north with a slope of 10% and is at an elevation of 300 m.

Established on July 24, 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=326 YEAR=1985



## Great Lakes Region ARNEWS plots

*G.M. Howse and M.J. Applejohn*

In Ontario, 27 plots have been established through the program. They are located in stands of the province's major commercial tree species - white pine, jack pine, white spruce, black spruce, sugar maple, white birch, yellow birch, trembling aspen, and red oak. A Norway spruce plantation is included as well.

Wherever possible, plots have been located in semi-mature stands to ensure that trees are old enough to have been exposed to the effects of acid rain but young enough to accommodate the long-term nature of the project. As well, the plots are distributed among the various sulfur dioxide and nitrous dioxide deposition zones in the province.

The descriptions of the 27 Great Lakes Region plots follow.

# PLOT NUMBER 501

ARNEWS PLOTS: ONTARIO

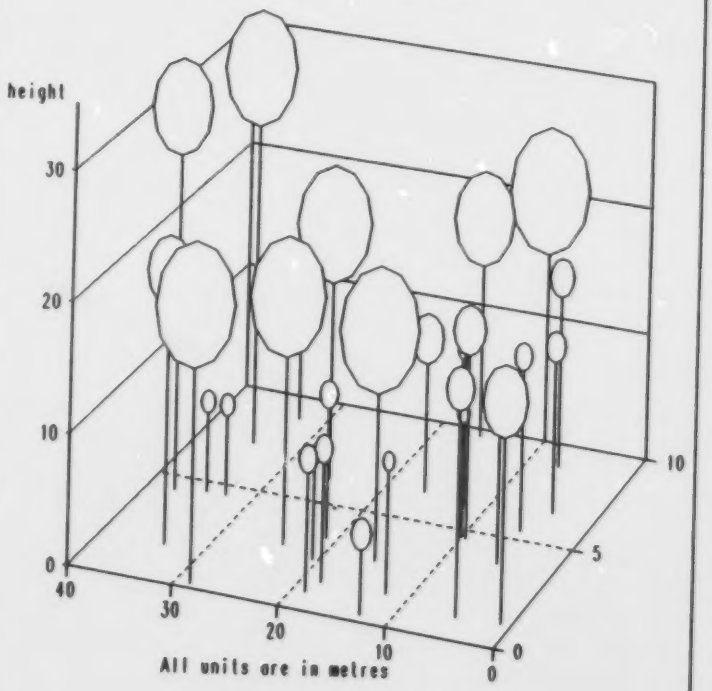
PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 24 | 16.6 | 19.8 | 14.6 |
| yellow birch | 3 | 42.6 | 11.8 | 18.3 |
| ironwood | 2 | 9.0 | 0.3 | 10.5 |
| totals and averages: | 29 | 18.7 | 32.0 | 14.7 |
| standing dead trees: | 0 | | | |

Turkey Lake, Wishart Township,
Sault Ste. Marie District
UTM: 16 698 5210

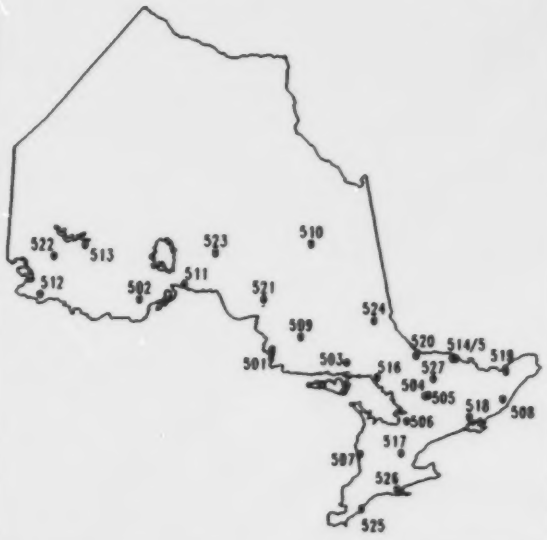
An uneven-aged semi-mature natural stand of the sugar maple-yellow birch cover type. The plot is in the Algoma Section of the Great Lakes - St. Lawrence Forest Region and faces southwest. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=501 YEAR=1984



# PLOT NUMBER 502

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 10 | 12.5 | 4.0 | 11.6 |
| black spruce | 68 | 13.5 | 27.3 | 12.7 |
| white birch | 17 | 9.3 | 3.2 | 8.8 |
| trembling aspen | 2 | 6.5 | 0.1 | 7.5 |
| totals and averages: | 97 | 12.5 | 34.7 | 11.8 |
| standing dead trees: | 0 | | | |

Fowler Township, Thunder Bay District

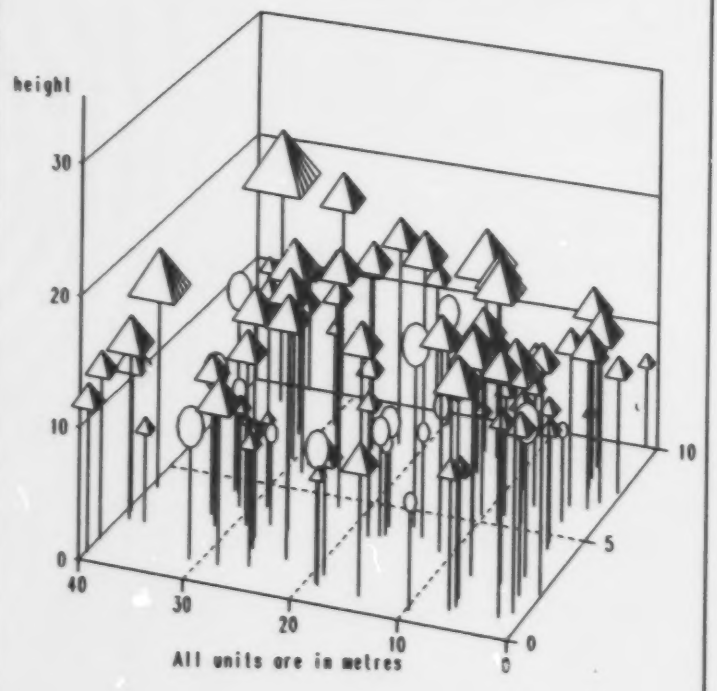
UTM: 16 310 5390

An uneven-aged semi-mature natural stand of the spruce-fir cover type. The plot is in the Superior Section of the Great Lakes – St. Lawrence Forest Region and is flat.

Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=502 YEAR=1984



# PLOT NUMBER 503

ARNEWS PLOTS: ONTARIO

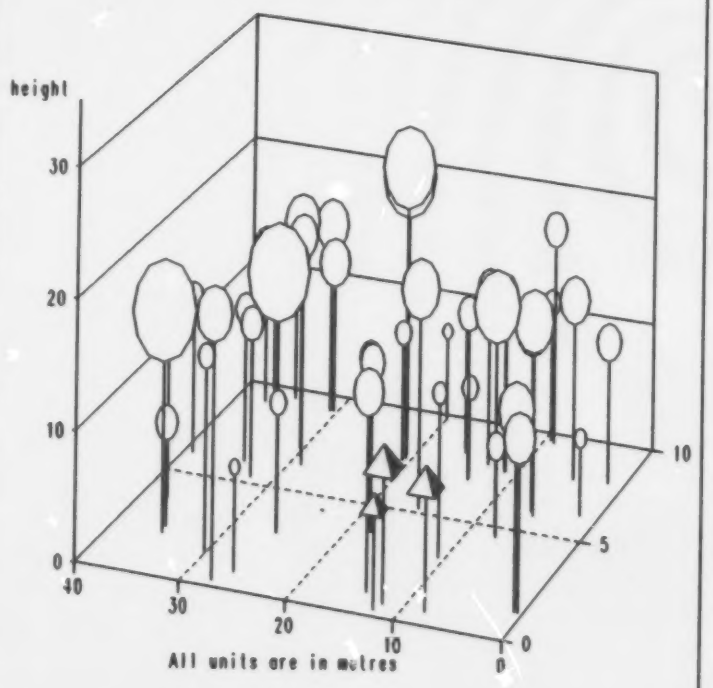
PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| eastern white cedar | 3 | 14.0 | 1.1 | 9.6 |
| striped maple | 1 | 6.0 | 0.0 | 6.0 |
| red maple | 8 | 10.2 | 1.7 | 11.6 |
| sugar maple | 15 | 14.1 | 7.3 | 13.0 |
| yellow birch | 2 | 19.5 | 2.0 | 15.0 |
| white birch | 9 | 13.8 | 4.2 | 14.8 |
| rough-barked ironwood | 2 | 17.0 | 1.1 | 14.0 |
| largetooth aspen | 8 | 12.3 | 2.6 | 14.1 |
| totals and averages: | 48 | 13.3 | 20.3 | 13.0 |
| standing dead trees: | 3 | | | |

Agnew Lake, Drury Township,
Sudbury District
UTM: 17 457 5138

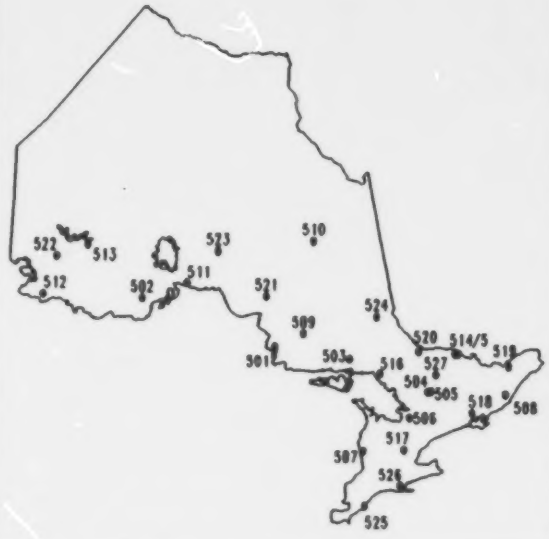
An even-aged semi-mature natural stand of the sugar maple-white birch-aspen cover type. The plot is in the Sudbury-North Bay Section of the Great Lakes - St. Lawrence Forest Region and faces west. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=503 YEAR=1984



# PLOT NUMBER 504

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| eastern white pine | 8 | 38.0 | 25.0 | 25.5 |
| sugar maple | 18 | 15.8 | 9.7 | 15.3 |
| white birch | 2 | 22.5 | 1.9 | 19.5 |
| white ash | 1 | 22.0 | 0.9 | 20.0 |
| ironwood | 1 | 8.0 | 0.1 | 9.0 |
| totals and averages: | 30 | 22.1 | 37.8 | 18.2 |
| standing dead trees: | 4 | | | |

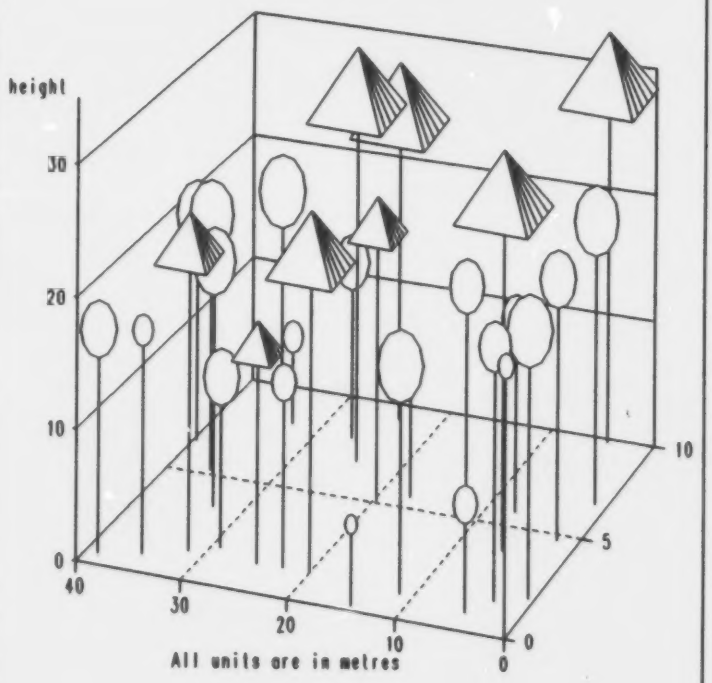
Sherborne Township, Minden District

UTM: 17 68 500

A two-aged mature stand of the eastern white pine-sugar maple cover type. The plot is in the Georgian Bay Section of the Great Lakes - St. Lawrence Forest Region and faces southeast. Established in 1984.

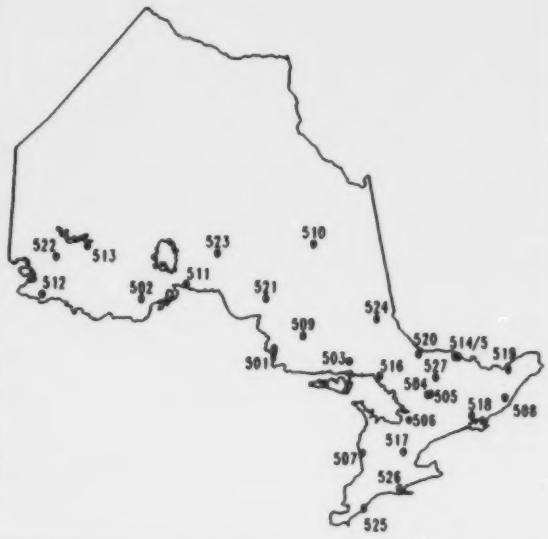
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=504 YEAR=1985



# PLOT NUMBER 505

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 1 | 12.0 | 0.2 | 15.0 |
| sugar maple | 22 | 22.9 | 26.9 | 19.5 |
| yellow birch | 2 | 46.5 | 9.2 | 22.0 |
| ironwood | 2 | 11.0 | 0.4 | 13.5 |
| black cherry | 1 | 11.0 | 0.2 | 13.0 |
| totals and averages: | 28 | 22.9 | 37.1 | 18.8 |
| standing dead trees: | 2 | | | |

Ridout Township, Bracebridge District

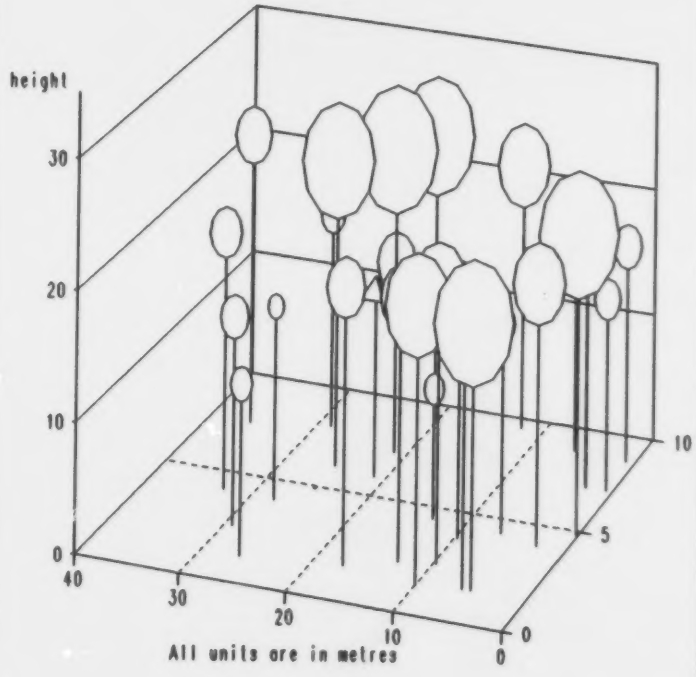
UTM: 17 67 500

A two-aged mature stand of the sugar maple-yellow birch cover type. The plot is in the Georgian Bay Section of the Great Lakes - St. Lawrence Forest Region and faces southeast.

Established in 1984.

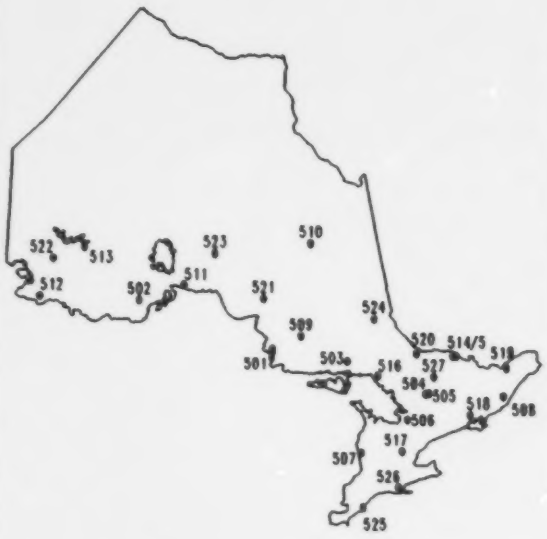
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=505 YEAR=1985



# PLOT NUMBER 506

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 31 | 19.1 | 25.2 | 19.6 |
| American beech | 2 | 4.8 | 0.0 | 5.0 |
| totals and averages: | 33 | 18.7 | 25.3 | 19.1 |
| standing dead trees: | 0 | | | |

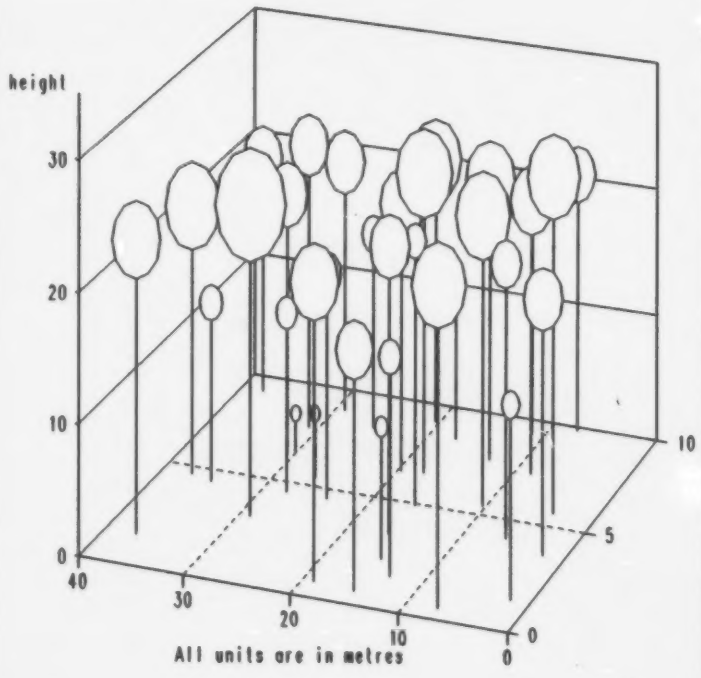
Craighurst, Oro Twp., Huronia District

UTM: 17 604 4931

An uneven-aged semi-mature stand of the sugar maple cover type. The plot is in the Huron-Ontario Section of the Great Lakes - St. Lawrence Forest Region and is flat. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=506 YEAR=1985



# PLOT NUMBER 507

ARNEWS PLOTS: ONTARIO

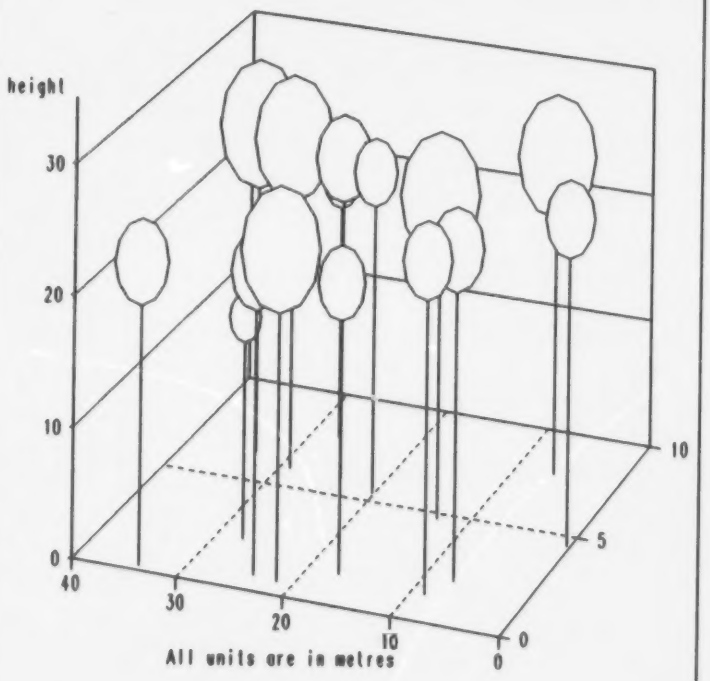
PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 15 | 31.1 | 32.6 | 23.8 |
| totals and averages: | 15 | 31.1 | 32.6 | 23.8 |
| standing dead trees: | 1 | | | |

Auburn, West Wawanosh Township,
Wingham District
UTM: 17 452 4855

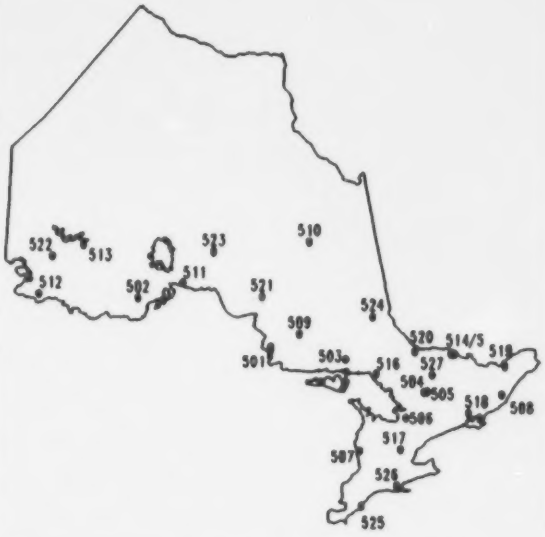
An uneven-aged mature woodlot of the sugar maple cover type. The plot is in the Huron-Ontario Section of the Great Lakes - St. Lawrence Forest Region and is flat. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=507 YEAR=1986



# PLOT NUMBER 508

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 15 | 33.0 | 35.9 | 24.0 |
| totals and averages: | 15 | 33.0 | 35.9 | 24.0 |
| standing dead trees: | 0 | | | |

Yonge and Escott Township,

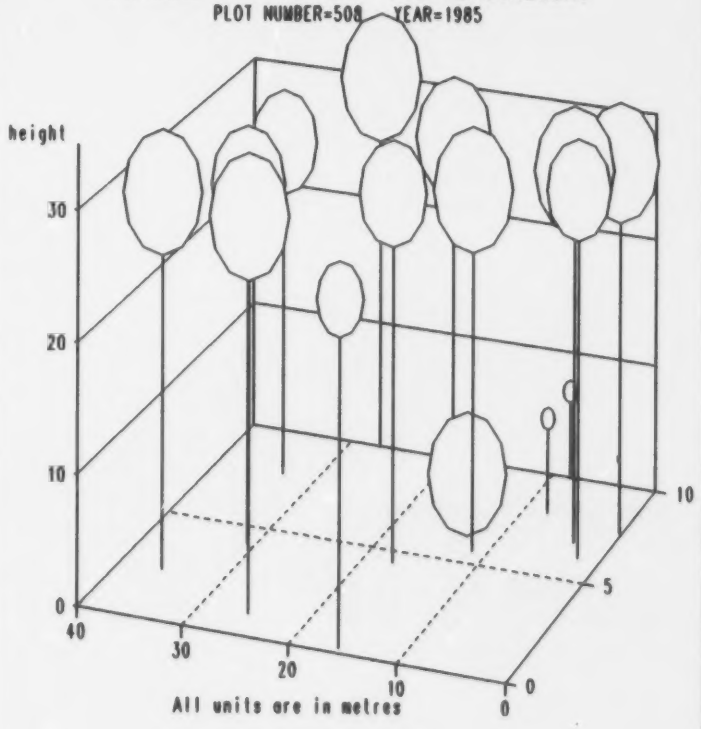
Brockville District

UTM: 18 42 494

An even-aged mature woodlot of the sugar maple cover type. The plot is in the Upper St. Lawrence Section of the Great Lakes - St. Lawrence Forest Region and is flat.

Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT



# PLOT NUMBER 509

ARNEWS PLOTS: ONTARIO

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| jack pine | 62 | 14.1 | 25.9 | 14.6 |
| totals and averages: | 62 | 14.1 | 25.9 | 14.6 |
| standing dead trees: | 0 | | | |

Flame Lake, Deans Township,

Chapleau District

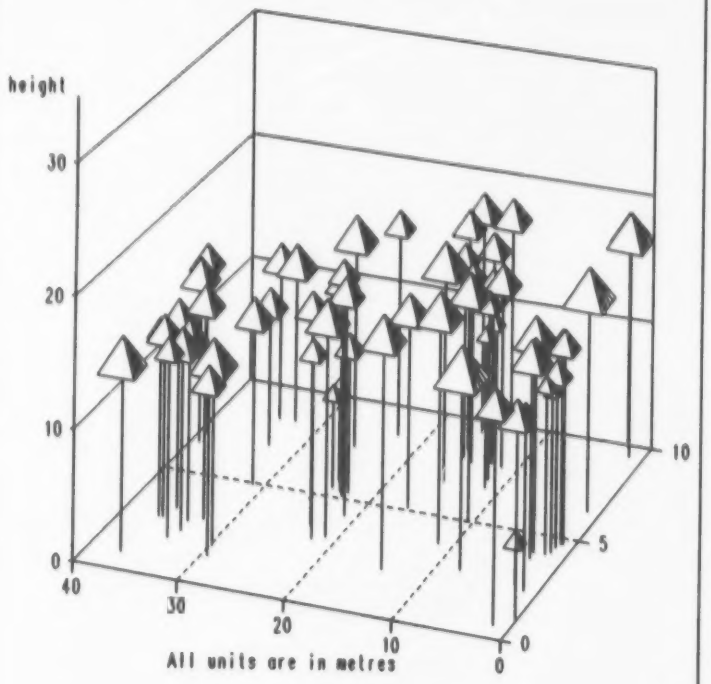
UTM: 17 333 5238

An even-aged mature stand of the jack pine cover type. The plot is in the Missinaibi-Cabonga Section of the Boreal Forest Region and is flat.

Established in 1984.

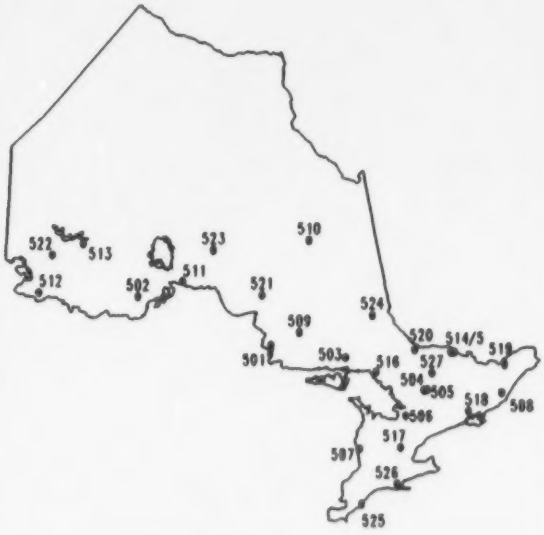
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=509 YEAR=1986



# PLOT NUMBER 510

ARNEWS PLOTS: ONTARIO



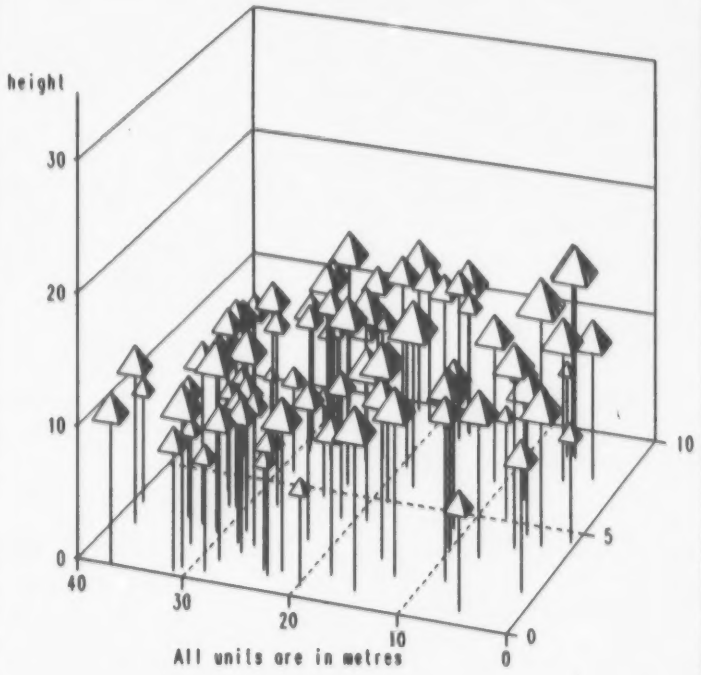

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| black spruce | 90 | 12.8 | 30.1 | 11.1 |
| totals and averages: | 90 | 12.8 | 30.1 | 11.1 |
| standing dead trees: | 2 | | | |

Smokey Line, Hopkins Township,
Kapuskasing District
UTM: 17 408 5517

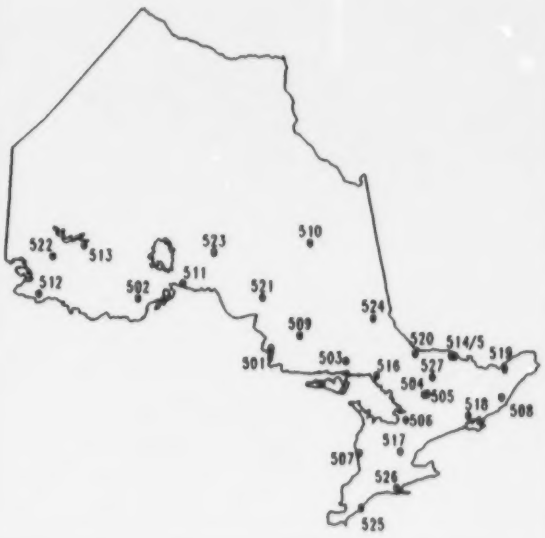
An even-aged immature stand of the black spruce-balsam fir cover type. The plot is in the Northern Clay Section of the Boreal Forest Region and is flat. Established in 1984.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=510 YEAR=1986



# PLOT NUMBER 511

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 2 | 12.5 | 0.3 | 13.0 |
| white spruce | 33 | 17.2 | 21.9 | 12.9 |
| black spruce | 16 | 18.3 | 8.6 | 12.6 |
| white birch | 17 | 13.7 | 6.7 | 13.9 |
| totals and averages: | 68 | 16.4 | 37.6 | 13.1 |
| standing dead trees: | 6 | | | |

Gravel River, Wiggins Township,

Terrace Bay District

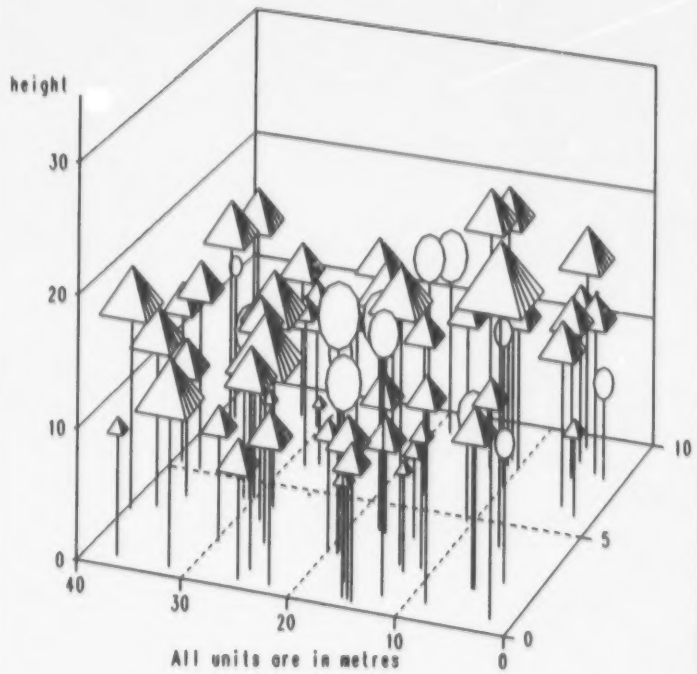
UTM: 16 447 5418

A two-aged semi-mature natural stand of the white spruce-black spruce cover type. The plot is in the Superior Section of the Boreal Forest Region and faces southeast.

Established in 1984.

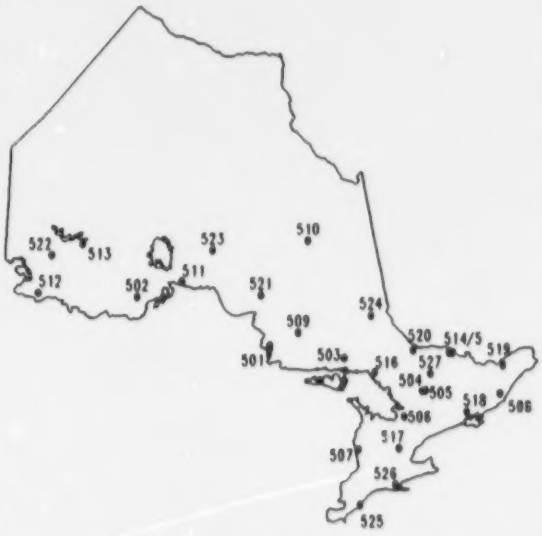
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=511 YEAR=1985



# PLOT NUMBER 512

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| jack pine | 62 | 16.7 | 35.7 | 18.3 |
| red maple | 1 | 8.6 | 0.1 | 8.5 |
| white birch | 2 | 19.2 | 1.4 | 17.2 |
| trembling aspen | 3 | 15.8 | 1.6 | 17.8 |
| totals and averages: | 68 | 16.6 | 38.9 | 18.1 |
| standing dead trees: | 1 | | | |

Dance Township, Fort Frances District

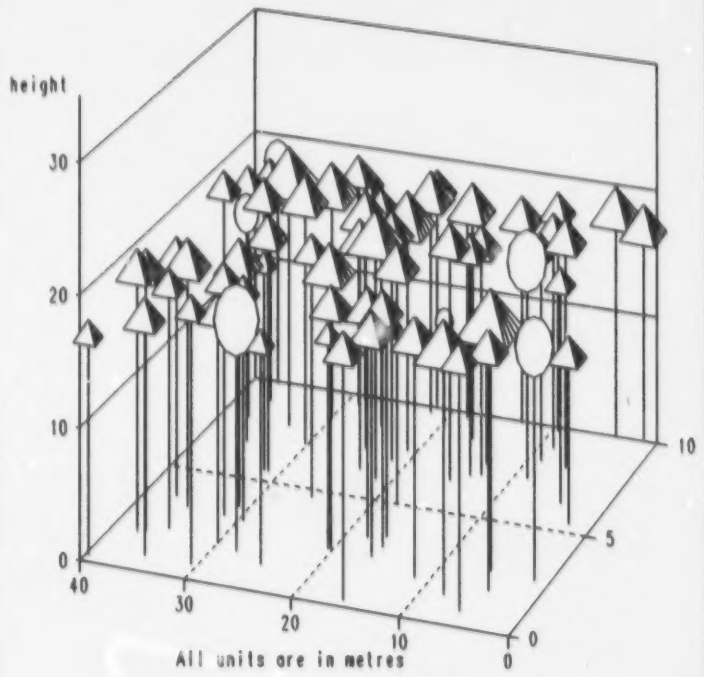
UTM: 15 451 5402

An even-aged semi-mature natural stand of the jack pine-white birch-aspen cover type. The plot is in the Quetico Section of the Great Lakes - St. Lawrence Forest Region and is flat.

Established in 1984.

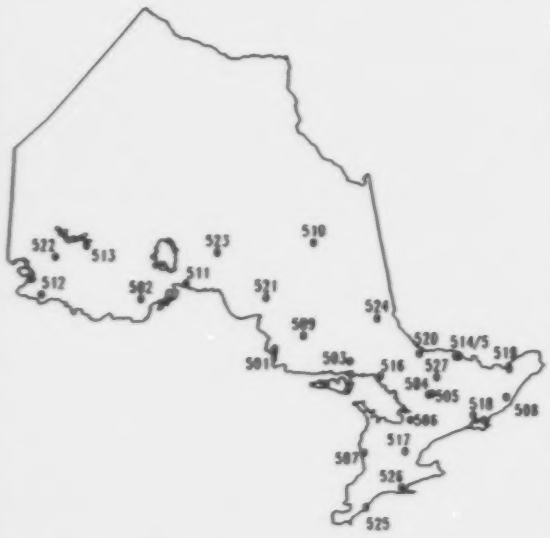
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=512 YEAR=1984



# PLOT NUMBER 513

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 9 | 6.6 | 0.8 | 6.8 |
| black spruce | 112 | 10.1 | 24.4 | 11.1 |
| jack pine | 14 | 18.0 | 9.8 | 16.3 |
| totals and averages: | 135 | 10.7 | 35.1 | 11.3 |
| standing dead trees: | 6 | | | |

Sandel Lake, Sioux Lookout District

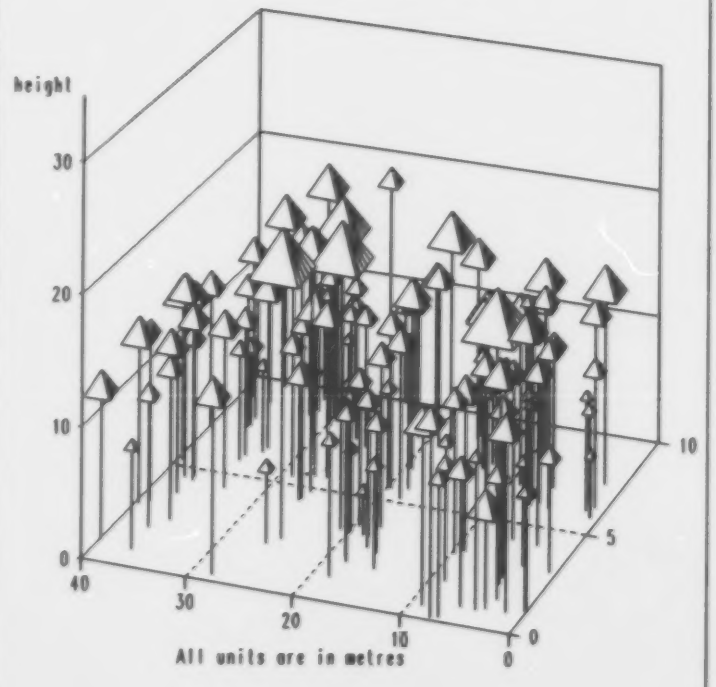
UTM: 15 584 5557

An even-aged semi-mature natural stand of the black spruce-jack pine cover type. The plot is in the Upper English River Section of the Boreal Forest Region and is flat.

Established in 1984.

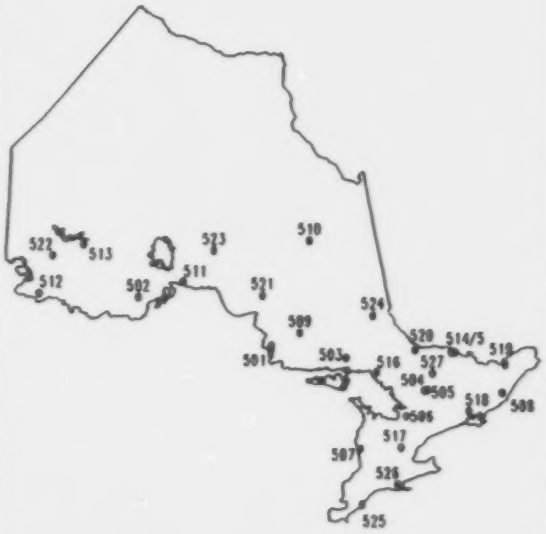
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=513 YEAR=1985



# PLOT NUMBER 514

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| white spruce | 25 | 14.5 | 10.9 | 5.1 |
| totals and averages: | 25 | 14.5 | 10.9 | 5.1 |
| standing dead trees: | 0 | | | |

Petawawa National Forestry Institute

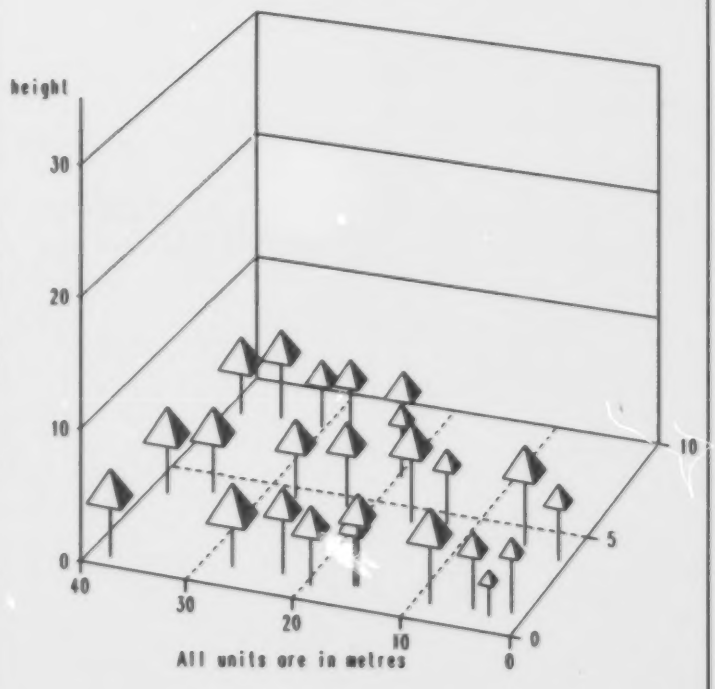
UTM: 18 310 5097

An even-aged semi-mature plantation of the white spruce cover type. The plot is in the Middle Ottawa Section of the Great Lakes – St. Lawrence Forest Region, is at an elevation of 152 m, and faces north.

Established in 1985.

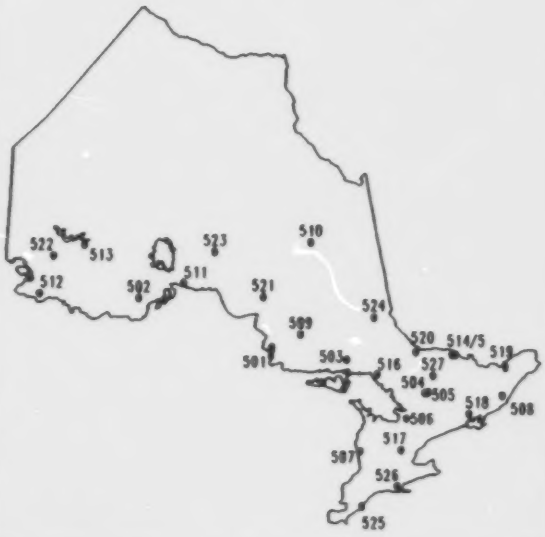
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=514 YEAR=1985



# PLOT NUMBER 515

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| Norway spruce | 32 | 14.3 | 13.3 | 8.4 |
| totals and averages: | 32 | 14.3 | 13.3 | 8.4 |
| standing dead trees: | 0 | | | |

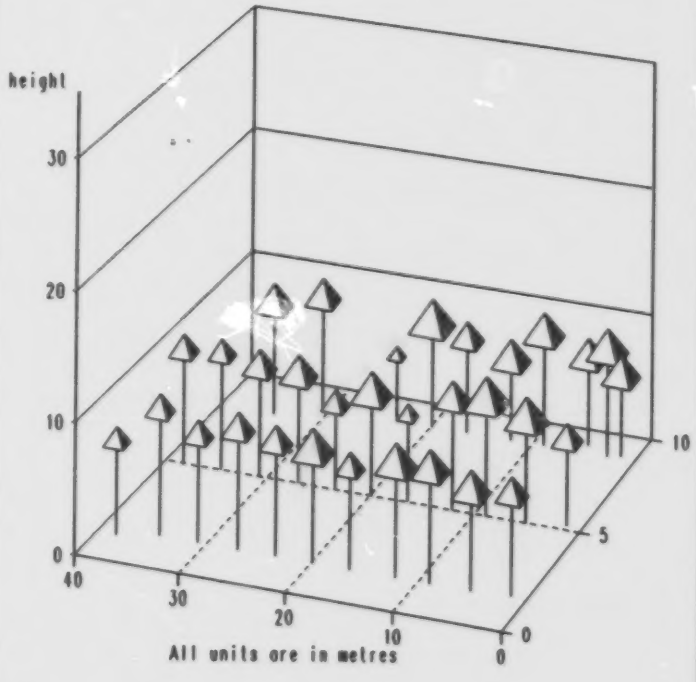
Petawawa National Forestry Institute

UTM: 18 310 5097

An even-aged semi-mature plantation (exotic species) of the spruce cover type. The plot is in the Middle Ottawa Section of the Great Lakes – St. Lawrence Forest Region, is at an elevation of 152 m, and faces north. Established in 1985.

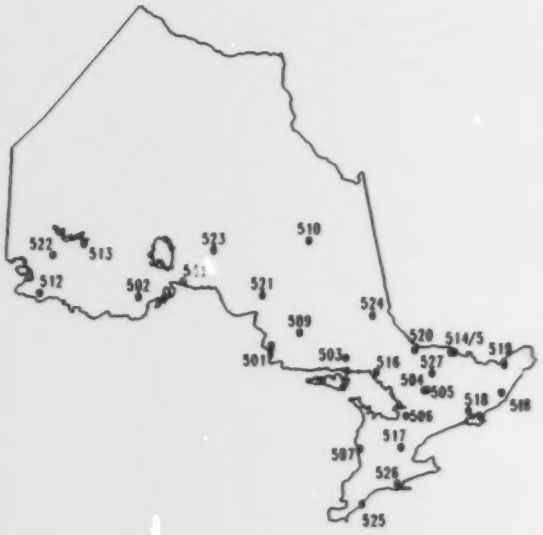
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=515 YEAR=1985



# PLOT NUMBER 516

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| white spruce | 2 | 4.6 | 0.0 | 6.2 |
| red maple | 14 | 5.1 | 0.7 | 11.7 |
| white birch | 21 | 4.7 | 1.0 | 12.5 |
| white ash | 1 | 2.3 | 0.0 | 7.5 |
| poplar | 1 | 10.3 | 0.2 | N/A |
| largetooth aspen | 2 | 3.5 | 0.0 | 8.0 |
| trembling aspen | 11 | 12.9 | 3.7 | 24.4 |
| totals and averages: | 52 | 6.5 | 5.9 | 14.3 |
| standing dead trees: | 2 | | | |

Grundy Lake Provincial Park,

Parry Sound District

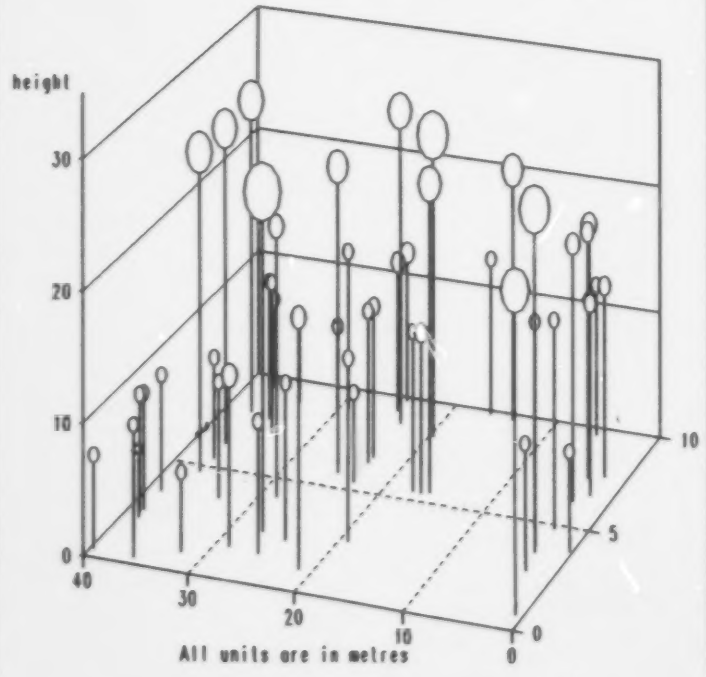
UTM: 17 54 508

A two-aged mature stand of the trembling aspen-white birch cover type. The plot is in the Georgian Bay Section of the Great Lakes - St. Lawrence Forest Region and is flat.

Established in 1985.

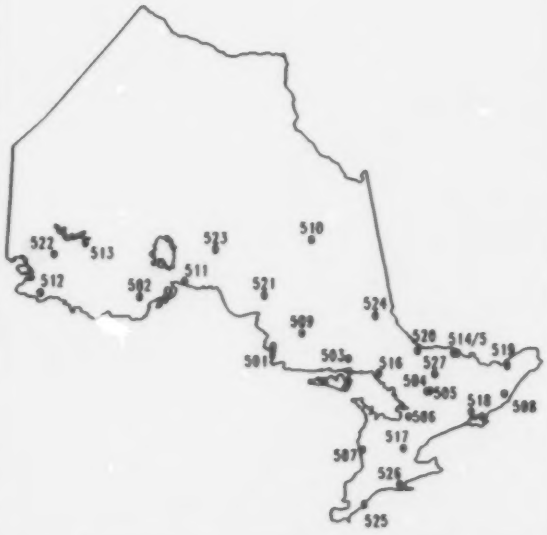
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=516 YEAR=1985



# PLOT NUMBER 517

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| eastern white pine | 28 | 20.0 | 23.5 | 13.2 |
| totals and averages: | 28 | 20.0 | 23.5 | 13.2 |
| standing dead trees: | 0 | | | |

Erin Township, Cambridge District

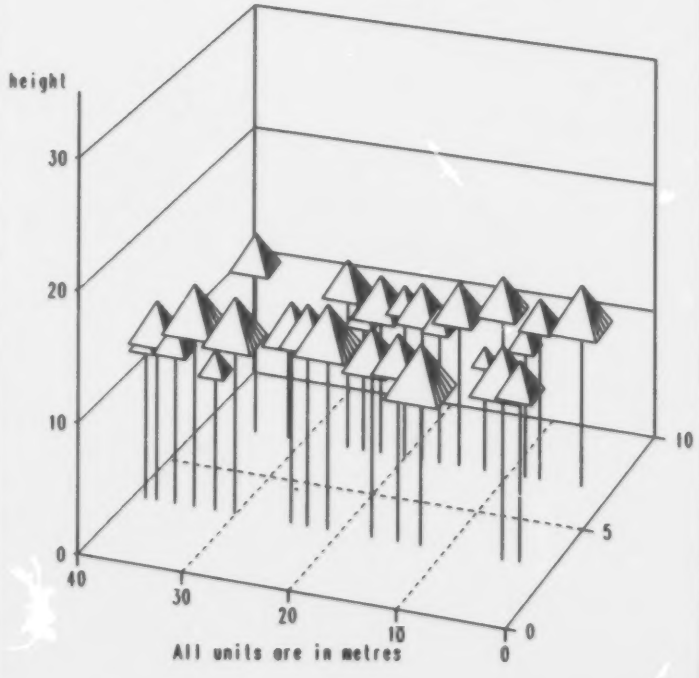
UTM: 17 572 4839

An even-aged immature plantation of the eastern white pine cover type. The plot is in the Huron-Ontario Section of the Great Lakes - St. Lawrence Forest Region, is at an elevation of 374 m, and is flat.

Established in 1985.

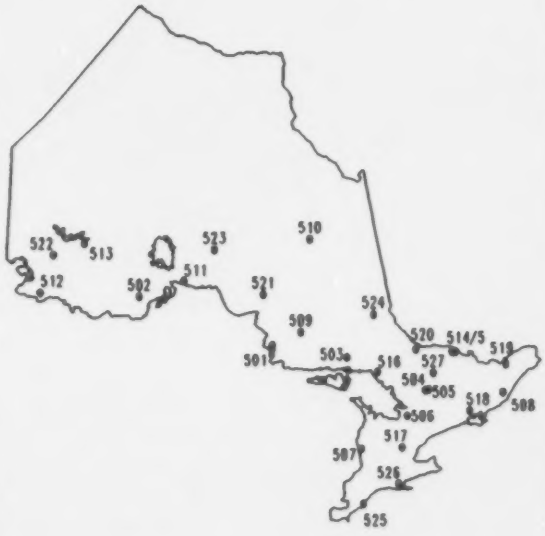
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=517 YEAR=1985



# PLOT NUMBER 518

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| eastern white pine | 65 | 14.0 | 27.5 | N/A |
| totals and averages: | 65 | 14.0 | 27.5 | N/A |
| standing dead trees: | 6 | | | |

Hungerford Township, Tweed District

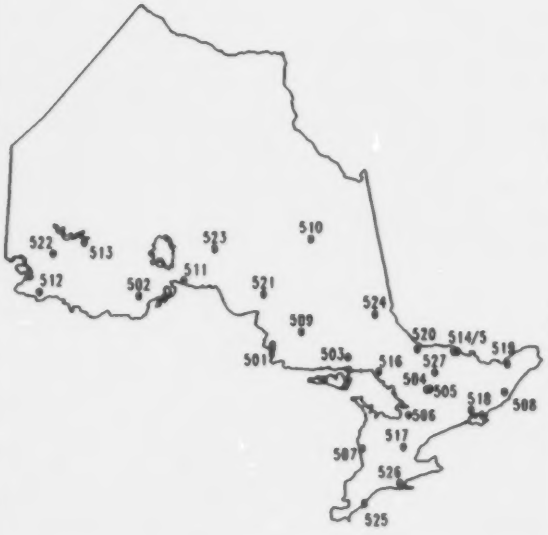
UTM: 18 31 491

An even-aged semi-mature plantation of the eastern white pine cover type. The plot is in the Huron-Ontario Section of the Great Lakes - St. Lawrence Forest Region, is flat, and was established in 1985. The complete data set was not available to draw the plot diagram.

DIAGRAM NOT AVAILABLE

# PLOT NUMBER 519

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| white spruce | 69 | 16.2 | 39.1 | 9.3 |
| totals and averages: | 69 | 16.2 | 39.1 | 9.3 |
| standing dead trees: | 0 | | | |

Gloucester Township,

Carleton Place District

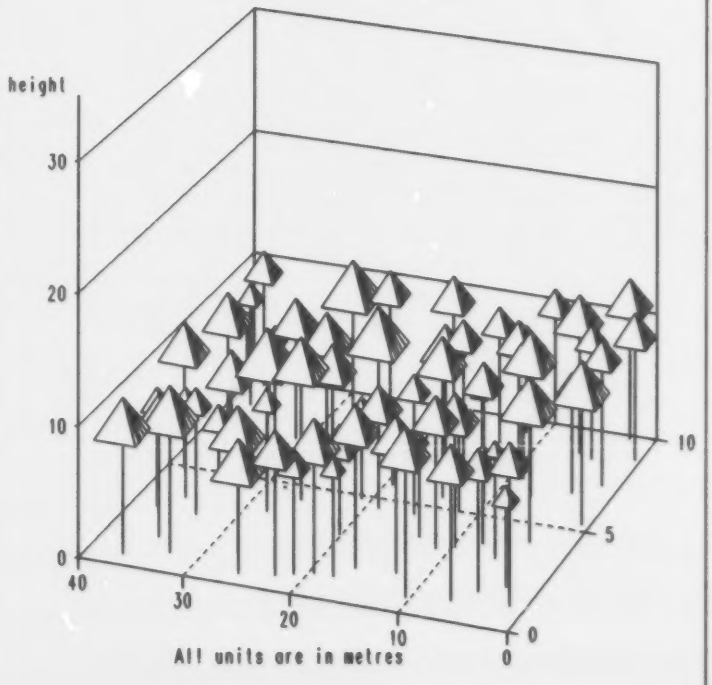
UTM: 18 45 502

An even-aged semi-mature plantation of the white spruce cover type. The plot is in the Upper St. Lawrence Section of the Great Lakes – St. Lawrence Forest Region and is flat.

Established in 1985.

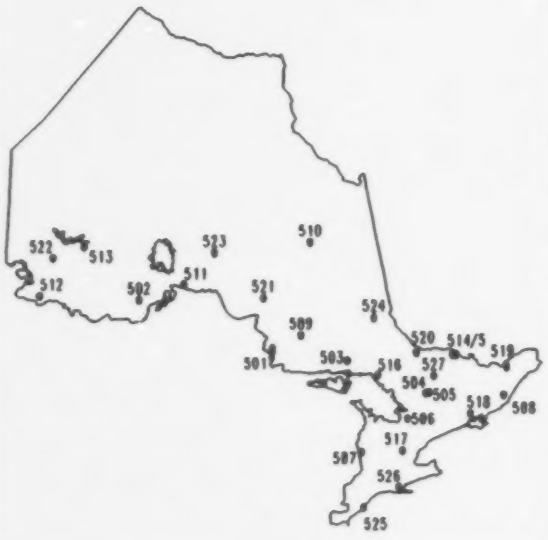
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=519 YEAR=1986



# PLOT NUMBER 520

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| red pine | 1 | 34.7 | 2.3 | 17.0 |
| white birch | 18 | 15.8 | 9.4 | 15.0 |
| largetooth aspen | 3 | 15.7 | 1.4 | 16.5 |
| trembling aspen | 19 | 17.5 | 12.3 | 17.7 |
| totals and averages: | 41 | 17.1 | 25.6 | 16.4 |
| standing dead trees: | 0 | | | |

Samuel de Champlain Provincial Park,

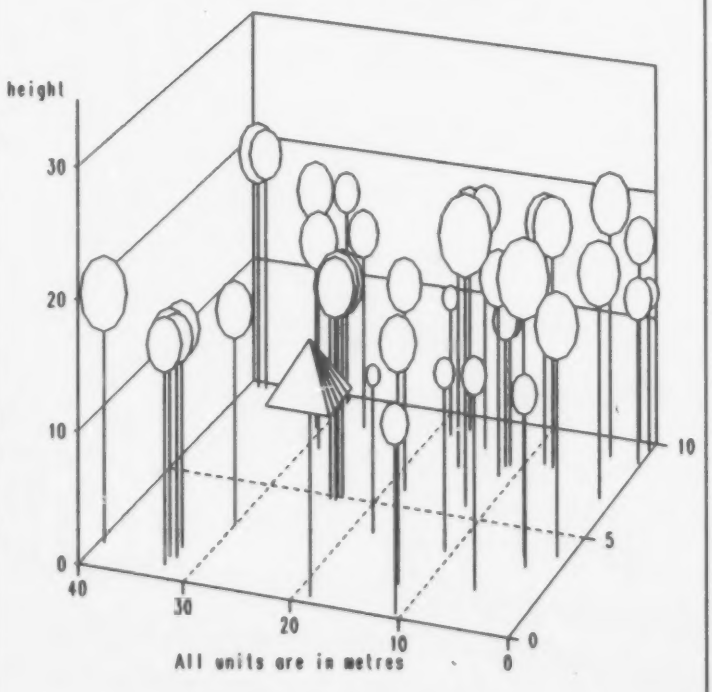
Calvin Township, North Bay District

UTM: 17 665 5127

An uneven-aged mature stand of the white birch-aspen-pine cover type. The plot is in the Sudbury-North Bay Section of the Great Lakes - St. Lawrence Forest Region and faces west. Established in 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=520 YEAR=1985



# PLOT NUMBER 521

ARNEWS PLOTS: ONTARIO

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| jack pine | 41 | 11.8 | 11.9 | 9.5 |
| totals and averages: | 41 | 11.8 | 11.9 | 9.5 |
| standing dead trees: | 0 | | | |

Huotari Township, Wawa District

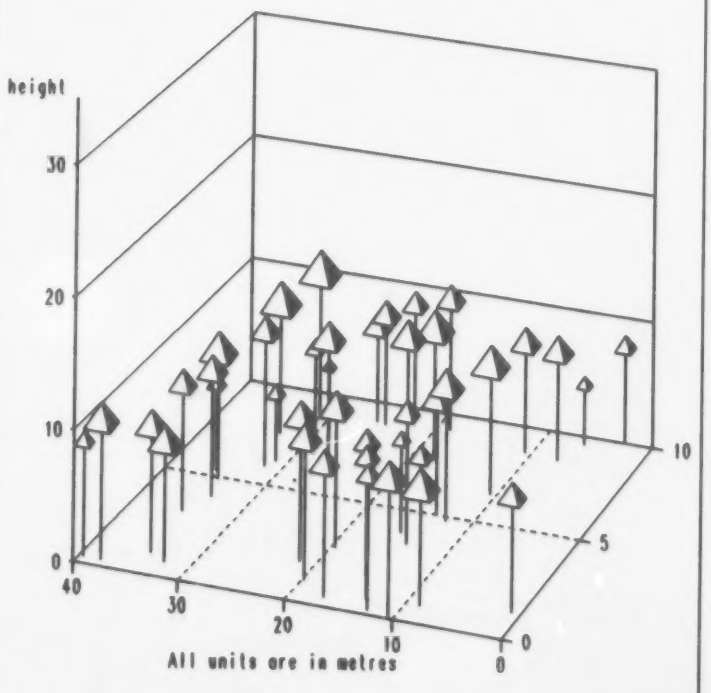
UTM: 16 684 5367

An even-aged semi-mature natural stand of the jack pine cover type. The plot is in the Central Plateau Section of the Boreal Forest Region, is at an elevation of 353 m, and is flat.

Established in 1985.

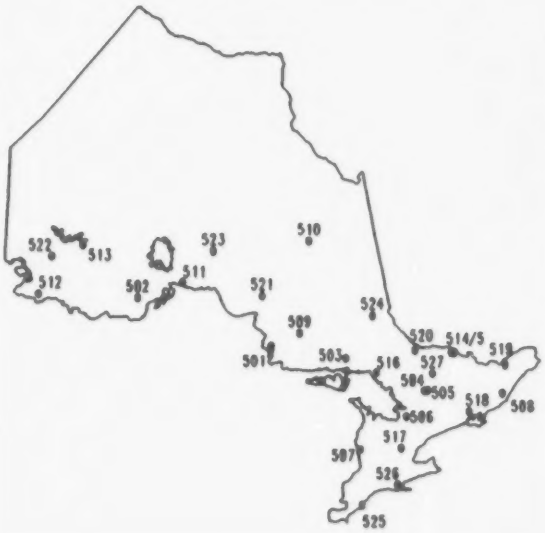
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=521 YEAR=1985



# PLOT NUMBER 522

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| jack pine | 18 | 22.4 | 20.0 | 14.8 |
| totals and averages: | 18 | 22.4 | 20.0 | 14.8 |
| standing dead trees: | 0 | | | |

Mafeking Township, Dryden District

UTM: 15 49 552

An even-aged semi-mature natural stand of the jack pine cover type. The plot is in the Lower English River Section of the Boreal Forest Region, is flat, and was established in 1985.

The complete data set was not available to draw the plot diagram.

DIAGRAM NOT AVAILABLE

# PLOT NUMBER 523

ARNEWS PLOTS: ONTARIO

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 1 | 31.4 | 1.9 | 16.6 |
| black spruce | 6 | 15.0 | 3.3 | 9.7 |
| jack pine | 10 | 16.6 | 5.6 | 12.9 |
| trembling aspen | 1 | 14.8 | 0.4 | 15.0 |
| totals and averages: | 18 | 16.8 | 11.3 | 12.1 |
| standing dead trees: | 0 | | | |

Margo Lake Road, Geraldton District

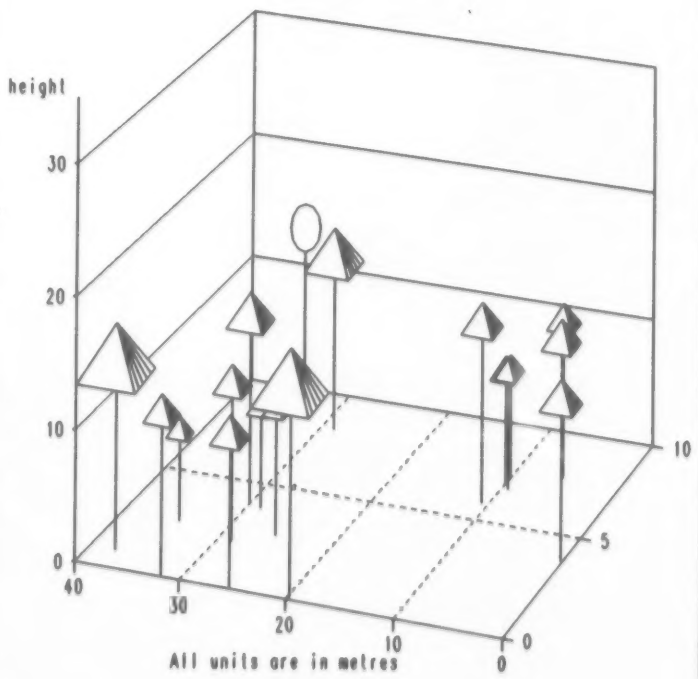
UTM: 16 548 5519

A two-aged semi-mature natural stand of the jack pine-black spruce cover type. The plot is in the Central Plateau Section of the Boreal Forest Region and is flat.

Established in 1985.

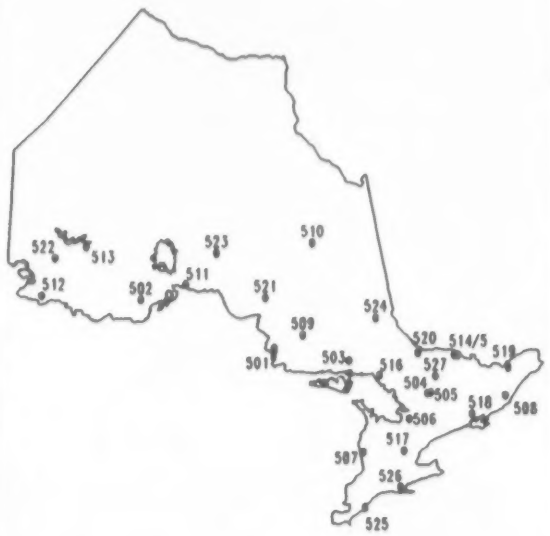
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=523 YEAR=1985



# PLOT NUMBER 524

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| jack pine | 75 | 14.3 | 31.2 | 11.3 |
| totals and averages: | 75 | 14.3 | 31.2 | 11.3 |
| standing dead trees: | 0 | | | |

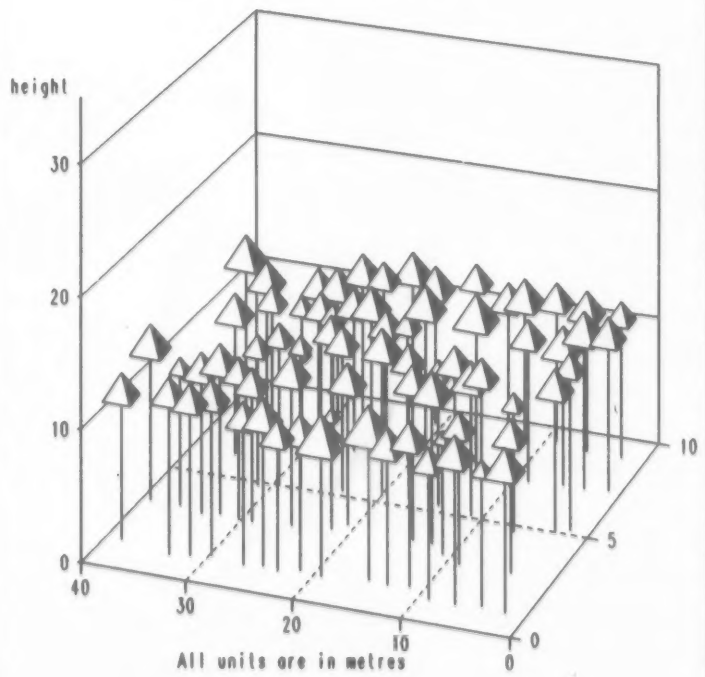
Cane Township, Kirkland Lake District

UTM: 17 575 5279

An even-aged immature plantation of the jack pine cover type. The plot is in the Missinaibi-Cabonga Section of the Boreal Forest Region and is flat. Established in 1985.

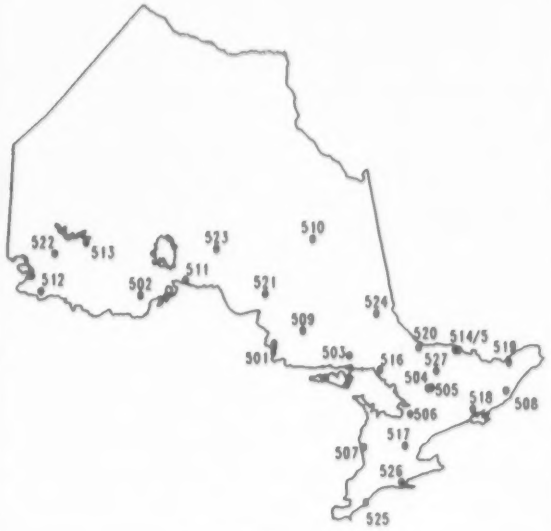
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=524 YEAR=1985



# PLOT NUMBER 525

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| sugar maple | 9 | 36.3 | 24.4 | 26.6 |
| totals and averages: | 9 | 36.3 | 24.4 | 26.6 |
| standing dead trees: | 0 | | | |

Howard Township, Chatham District

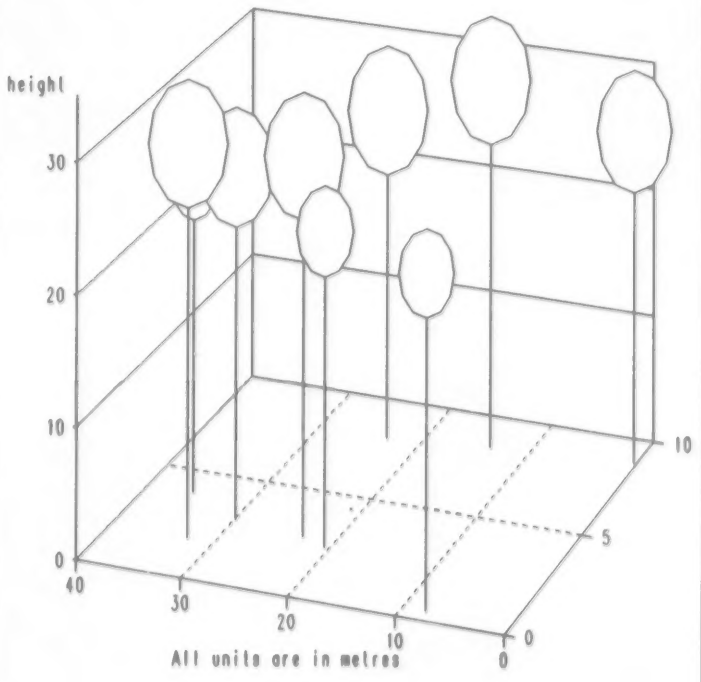
UTM: 17 43 469

An uneven-aged mature woodlot of the sugar maple cover type. The plot is in the Niagara Section of the Deciduous Forest Region and is flat.

Established in 1985.

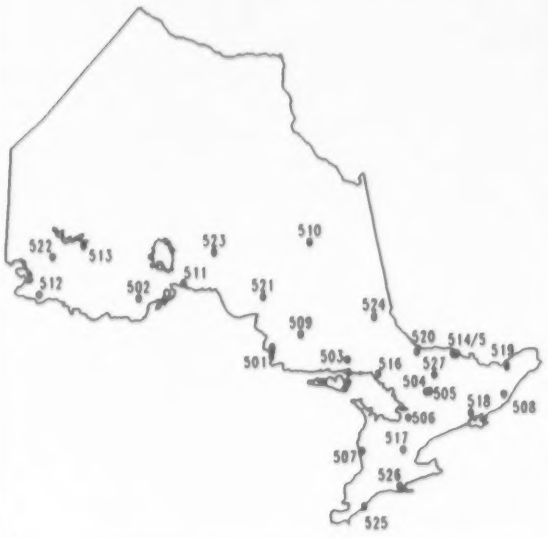
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=525 YEAR=1985



# PLOT NUMBER 526

ARNEWS PLOTS: ONTARIO




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| eastern white pine | 1 | 10.5 | 0.2 | 8.7 |
| black cherry | 4 | 12.8 | 1.3 | 12.2 |
| white oak | 4 | 19.6 | 3.0 | 15.7 |
| black oak | 7 | 32.7 | 14.9 | 20.1 |
| totals and averages: | 16 | 23.1 | 19.5 | 16.3 |
| standing dead trees: | 0 | | | |

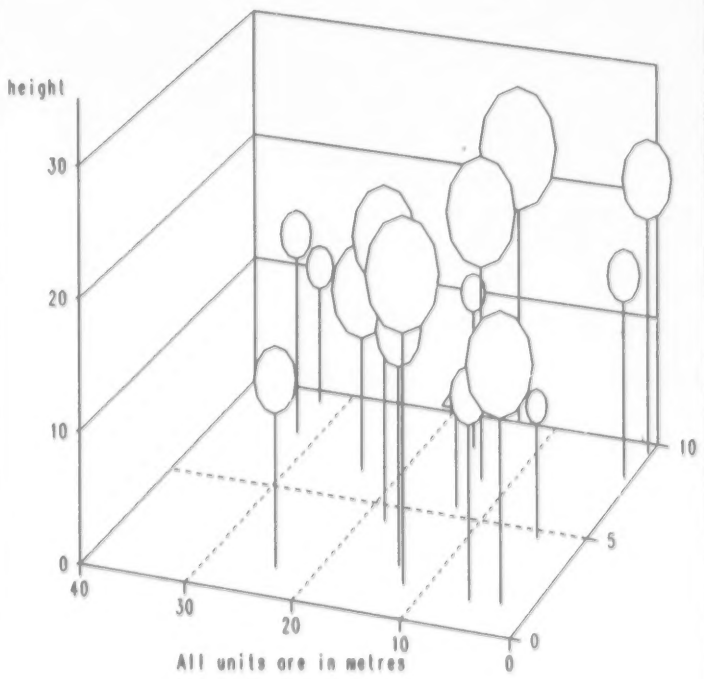
South Walsingham Twp., Simcoe District

UTM: 17 547 4727

An uneven-aged mature stand of the mixedwood-eastern white pine cover type. The plot is in the Niagara Section of the Deciduous Forest Region, is at an elevation of 213 m, and faces north. Established in 1986.

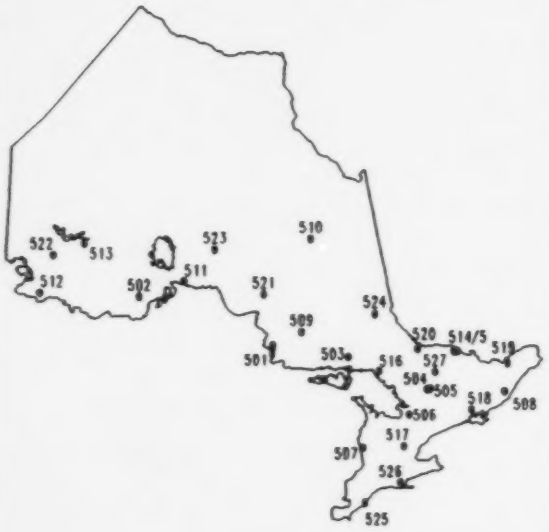
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=526 YEAR=1986



# PLOT NUMBER 527

ARNEWS PLOTS: ONTARIO



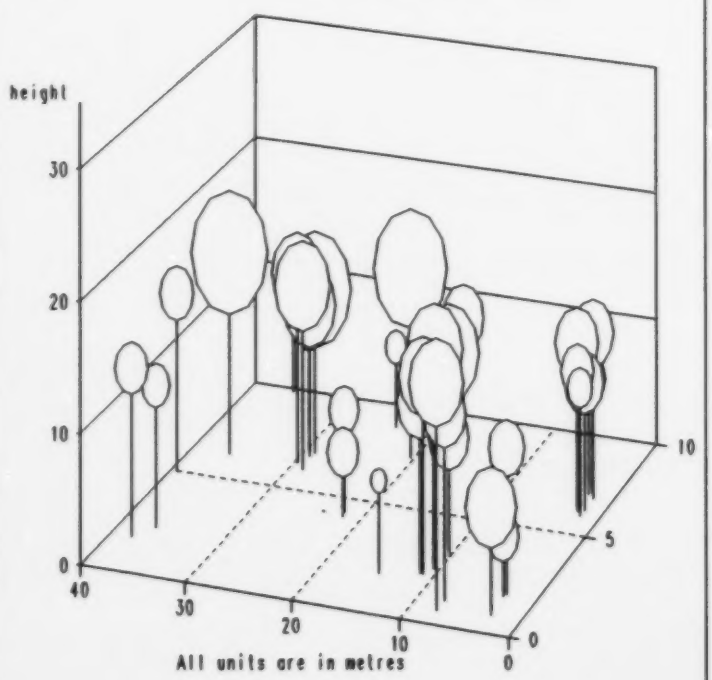

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| red maple | 7 | 13.6 | 2.8 | 10.4 |
| ironwood | 2 | 10.8 | 0.4 | 11.0 |
| black cherry | 4 | 13.8 | 1.5 | 8.0 |
| red oak | 24 | 23.7 | 28.8 | 12.4 |
| totals and averages: | 37 | 20.0 | 33.7 | 11.6 |
| standing dead trees: | 1 | | | |

Coon Lake, Sproule Township,
Algonquin District
UTM: 17 703 5047

An uneven-aged mature stand of the oak-red maple cover type. The plot is in the Algonquin-Pontiac Section of the Great Lakes - St. Lawrence Forest Region, is at an elevation of 488 m, and faces east. Established in 1986.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=527 YEAR=1986



## Northern Region ARNEWS plots

*H.F. Cerezke*

Participation by FIDS in monitoring for acid rain effects under the ARNEWS program was initiated in the Region in 1984. We first considered examination of field plots established earlier, as part of a biomonitoring program under the Canadian Forestry Service Toxic Substances project near Fort McMurray and Rocky Mountain House, Alberta, and near Flin Flon and Thompson, Manitoba. However, because of plot parameters for a long-term program, only one of these earlier plots was retained in the ARNEWS project.

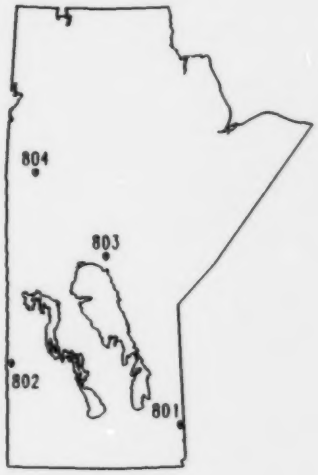
The 20 x 20 m plot No. 810 near Rocky Mountain House was established in mature lodgepole pine cover in the Upper Foothills Section of the Boreal Forest Region. Considerable soil and vegetation information had been collected in the Region prior to 1984. In 1985, nine additional permanent plots were established, three in Alberta, two in Saskatchewan, and four in Manitoba, all in the standard 10 x 40 m fixed dimension. Baseline vegetation, soil, foliage, tree growth, and insect and disease incidence data were recorded in all 10 plots. When establishing the nine new plots, an attempt was made to locate them in semi-mature forest cover types so that long term monitoring results (20-25 years, for example) would be minimally biased by natural stand maturity factors that might include tree decline, increased decay incidence, etc. Some uniformity of forest cover types would have been desirable in all plots within the region. However, this was not possible for reasons of plot and forest type distribution pattern and the problem of securing long-term site protection from disturbance and accessibility. To help secure long-term protection, several of the plots have been located in national and provincial parks.

In 1986, two additional ARNEWS plots were established, one near Fort McMurray, Alberta, and the other near Hudson Bay, Saskatchewan. This provides a total complement of 12 permanent sampling plots that will be maintained in the Region.

The descriptions of the 12 Northern Region plots follow.

# PLOT NUMBER 801

ARNEWS PLOTS: MANITOBA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| jack pine | 38 | 11.7 | 10.4 | 11.0 |
| totals and averages: | 38 | 11.7 | 10.4 | 11.0 |
| standing dead trees: | 0 | | | |

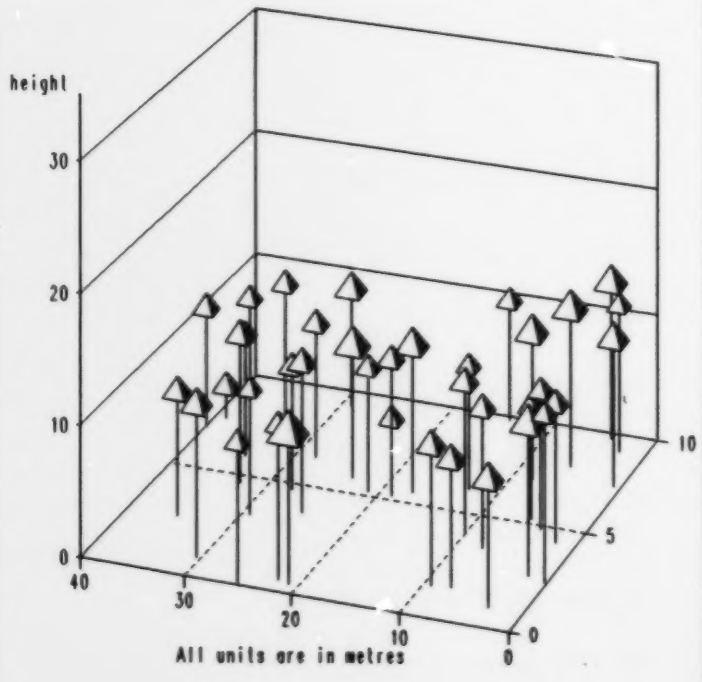
Whiteshell Provincial Park

UTM: 15 32 555

A young even-aged pure stand of jack pine in the Lower English River Section (B. 14) of the Boreal Forest Region. The plot is flat and has an elevation of 355 m. The average age of the trees was 35 years when the plot was established in 1985.

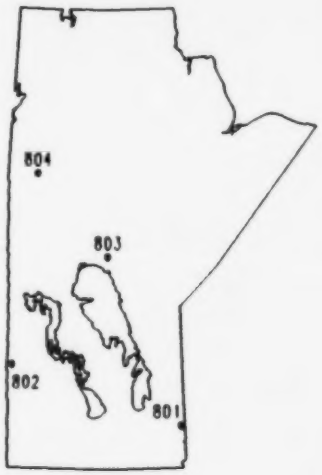
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=801 YEAR=1985



# PLOT NUMBER 802

ARNEWS PLOTS: MANITOBA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| white spruce | 9 | 15.7 | 4.6 | 11.9 |
| black spruce | 12 | 13.2 | 4.2 | 10.4 |
| trembling aspen | 32 | 17.0 | 20.2 | 15.9 |
| totals and averages: | 53 | 15.9 | 29.1 | 13.9 |
| standing dead trees: | 0 | | | |

Duck Mountain Provincial Park

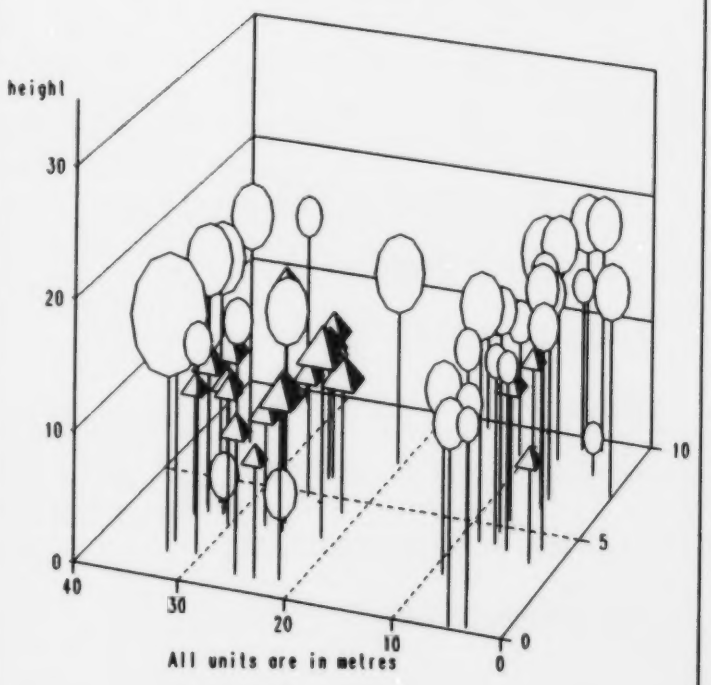
UTM: 14 32 572

An uneven-aged mixed stand of aspen-black spruce-white spruce in the Mixedwood Section (B. 18a) of the Boreal Forest Region. The plot is flat and has an elevation of 700 m.

The average age of black spruce was 56 years and white spruce 38 years when the plot was established in 1985.

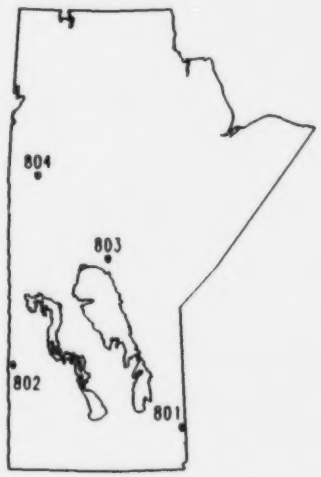
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=802 YEAR=1985



# PLOT NUMBER 803

ARNEWS PLOTS: MANITOBA




PLOT SPECIES CHARACTERISTICS

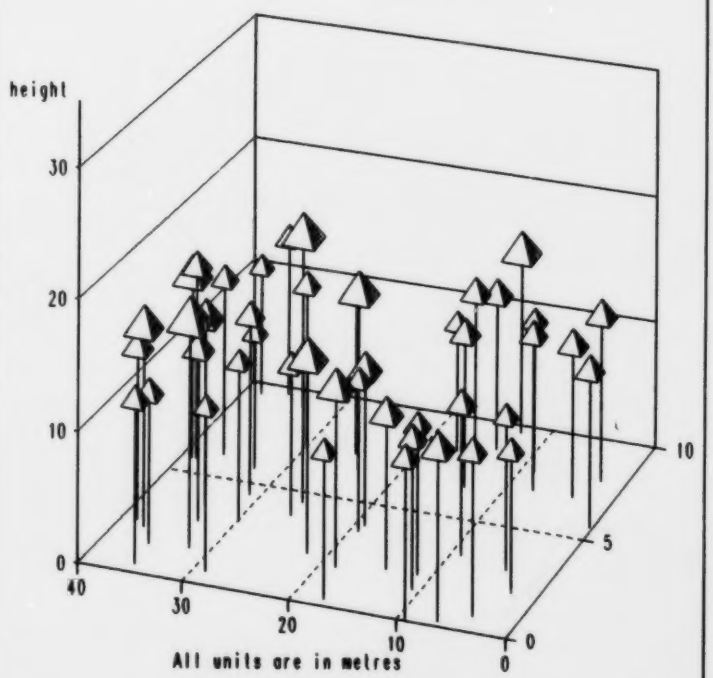
| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| jack pine | 46 | 12.6 | 14.7 | 13.0 |
| totals and averages: | 46 | 12.6 | 14.7 | 13.0 |
| standing dead trees: | 1 | | | |

Jenpeg

UTM: 14 57 602

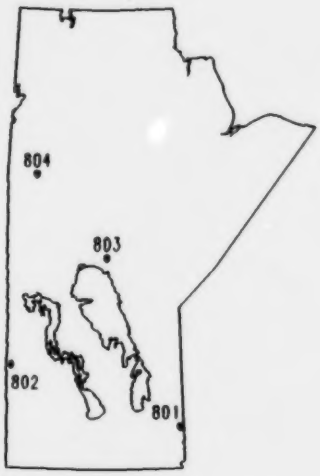
An even-aged pure stand of jack pine in the Nelson River Section (B. 21) of the Boreal Forest Region. The plot is flat and has an elevation of 700 m. The average age of the trees was 65 years when the plot was established in 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=803 YEAR=1985



# PLOT NUMBER 804

ARNEWS PLOTS: MANITOBA




PLOT SPECIES CHARACTERISTICS

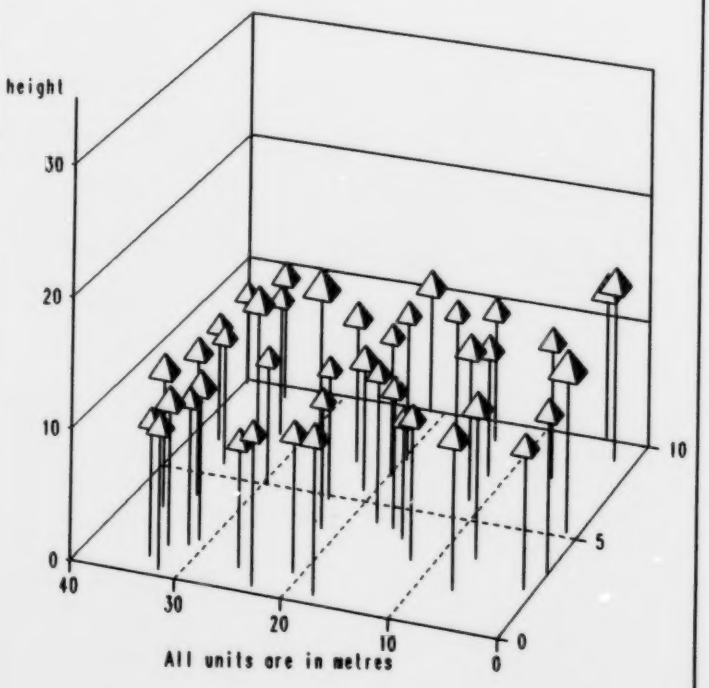
| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| jack pine | 43 | 11.5 | 11.3 | 11.2 |
| totals and averages: | 43 | 11.5 | 11.3 | 11.2 |
| standing dead trees: | 0 | | | |

Suwannee River

UTM: 14 43 621

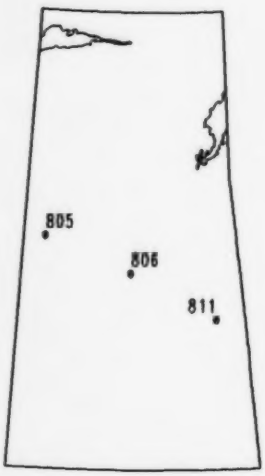
An even-aged pure stand of jack pine in the Nelson River Section (B. 21) of the Boreal Forest Region. The plot is flat and has an elevation of 950 m. The average age of the trees was 67 years when the plot was established in 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=804 YEAR=1985



# PLOT NUMBER 805

ARNEWS PLOTS: SASKATCHEWAN




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| jack pine | 47 | 13.5 | 17.4 | 10.2 |
| totals and averages: | 47 | 13.5 | 17.4 | 10.2 |
| standing dead trees: | 3 | | | |

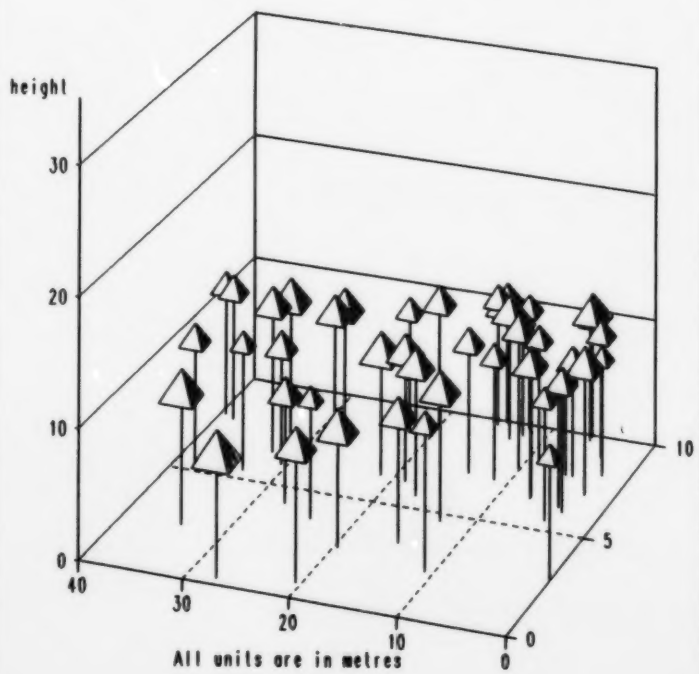
Meadow Lake Provincial Park

UTM: 12 63 603

An even-aged pure stand of jack pine in the Mixedwood Section (B. 18a) of the Boreal Forest Region. The plot is flat and has an elevation of 840 m. The average age of the trees was 41 years when the plot was established in 1985.

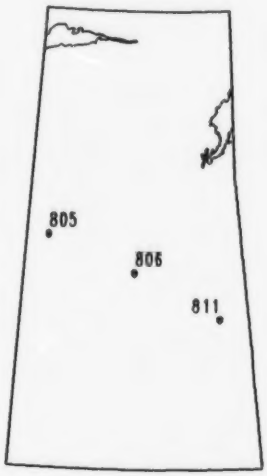
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=805 YEAR=1985



# PLOT NUMBER 806

ARNEWS PLOTS: SASKATCHEWAN




PLOT SPECIES CHARACTERISTICS

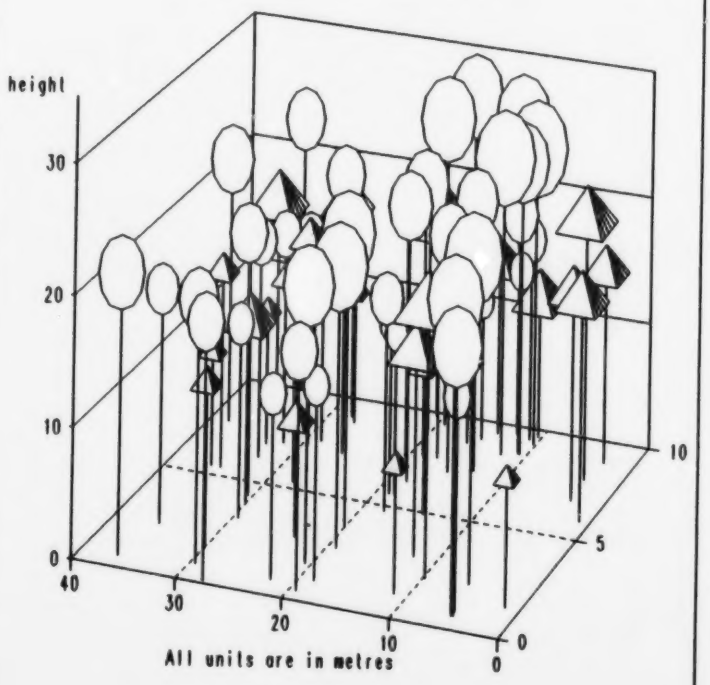
| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| white spruce | 25 | 17.4 | 16.2 | 15.1 |
| black spruce | 2 | 12.8 | 0.6 | 9.7 |
| trembling aspen | 45 | 19.3 | 36.1 | 19.0 |
| totals and averages: | 72 | 18.4 | 53.0 | 17.4 |
| standing dead trees: | 8 | | | |

Prince Albert National Park

UTM: 13 43 596

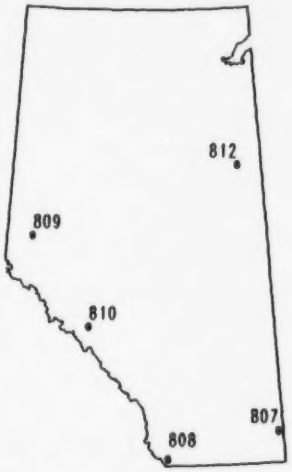
An uneven-aged mixed stand of aspen-spruce in the Mixedwood Section (B. 18a) of the Boreal Forest Region. The plot is flat and has an elevation of 515 m. The average age of the trees was 49 years when the plot was established in 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=806 YEAR=1985



# PLOT NUMBER 807

ARNEWS PLOTS: ALBERTA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| lodgepole pine | 60 | 12.2 | 18.1 | 11.0 |
| totals and averages: | 60 | 12.2 | 18.1 | 11.0 |
| standing dead trees: | 0 | | | |

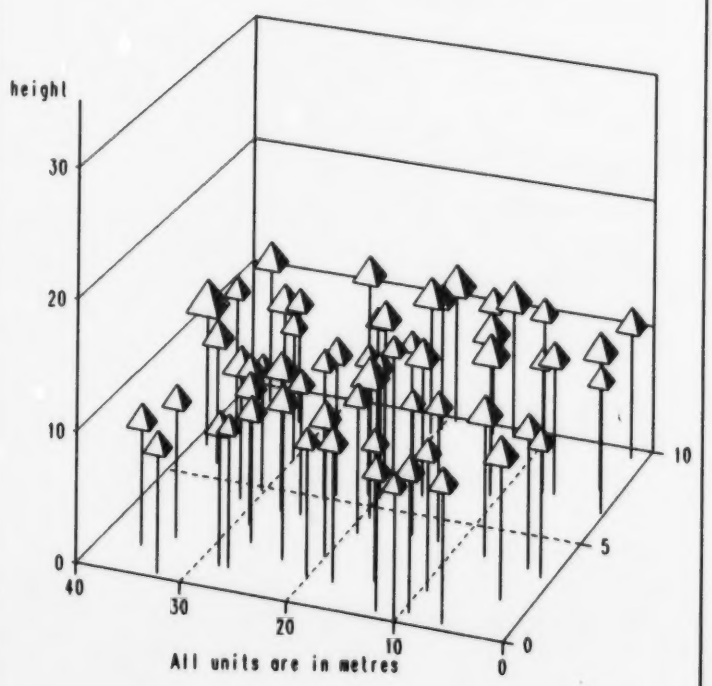
Cypress Hills Provincial Park

UTM: 12 56 549

An even-aged pure stand of lodgepole pine in the Lower Foothills Section (B. 19a) of the Boreal Forest Region. The plot is flat and has an elevation of 1430 m. The average age of the trees was 69 years when the plot was established in 1985.

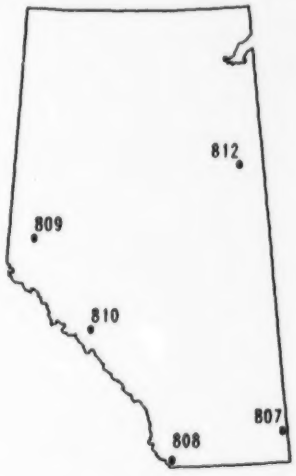
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=807 YEAR=1985



# PLOT NUMBER 808

ARNEWS PLOTS: ALBERTA




PLOT SPECIES CHARACTERISTICS

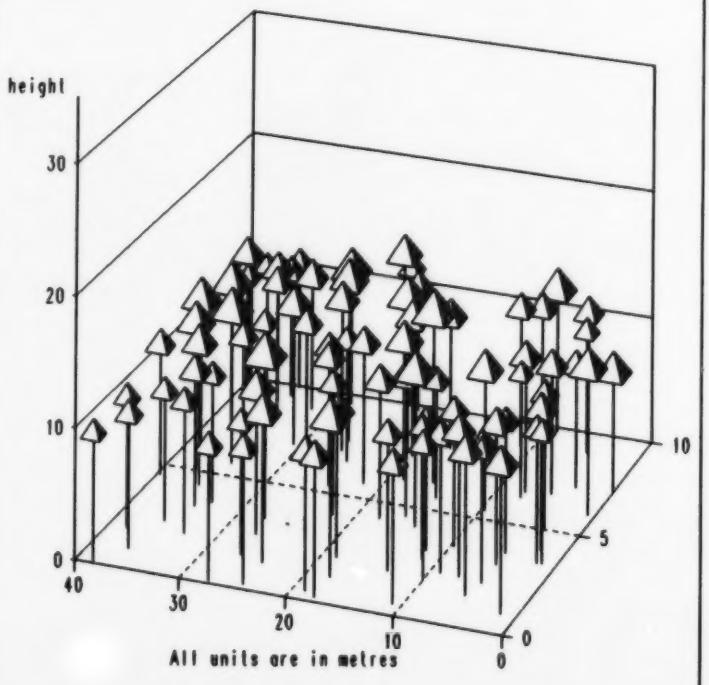
| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| lodgepole pine | 86 | 12.9 | 28.7 | 11.1 |
| totals and averages: | 86 | 12.9 | 28.7 | 11.1 |
| standing dead trees: | 1 | | | |

Waterton Lakes National Park

UTM: 12 28 544

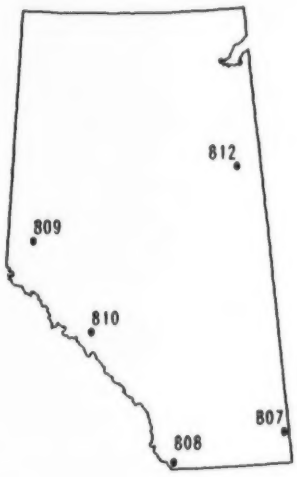
An even-aged pure stand of lodgepole pine in the Douglas-fir and Lodgepole Section (M. 5) of the Montane Forest Region. The plot is nearly flat with a slight southerly exposure and has an elevation of 1680 m. The average age of the trees was 61 years when the plot was established in 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=808 YEAR=1985



# PLOT NUMBER 809

ARNEWS PLOTS: ALBERTA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| white spruce | 29 | 16.2 | 16.2 | 9.2 |
| black spruce | 9 | 15.2 | 4.4 | 8.5 |
| white birch | 2 | 12.2 | 0.5 | 11.0 |
| totals and averages: | 40 | 15.7 | 21.2 | 9.0 |

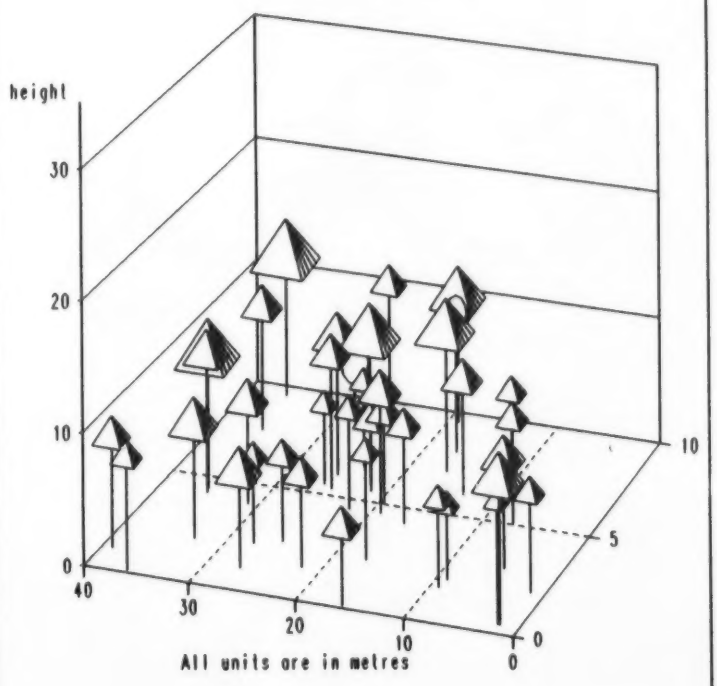
Grande Prairie

UTM: 11 38 606

An uneven-aged stand of white and black spruce, mixed with a minor component of birch, in the Lower Foothills Section (B. 19a) of the Boreal Forest Region. The plot is flat and has an elevation of 915 m. The average age of the trees was 36 years when the plot was established in 1985.

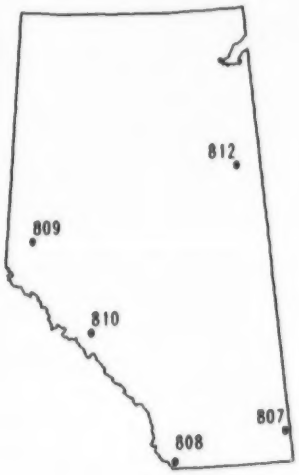
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=809 YEAR=1985



# PLOT NUMBER 810

ARNEWS PLOTS: ALBERTA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 1 | 10.5 | 0.2 | 6.3 |
| lodgepole pine | 59 | 19.8 | 47.6 | 19.4 |
| totals and averages: | 60 | 19.6 | 47.8 | 19.1 |
| standing dead trees: | 0 | | | |

Rocky Mountain House

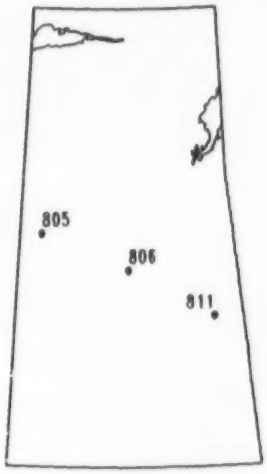
UTM: 11 59 578

An even-aged pure stand of lodgepole pine in the Upper Foothills Section (B. 19c) of the Boreal Forest Region. The plot is flat and has an elevation of 1420 m. The average age of the trees was 91 years when the plot was established in 1985. The plot diagram was not drawn as the plot measures 20 m by 20 m.

DIAGRAM NOT AVAILABLE

# PLOT NUMBER 811

ARNEWS PLOTS: SASKATCHEWAN




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| white spruce | 57 | 15.1 | 26.7 | 11.9 |
| balsam poplar | 1 | 16.5 | 0.5 | N/A |
| trembling aspen | 4 | 21.6 | 3.7 | N/A |
| totals and averages: | 62 | 15.6 | 31.0 | 11.9 |
| standing dead trees: | 1 | | | |

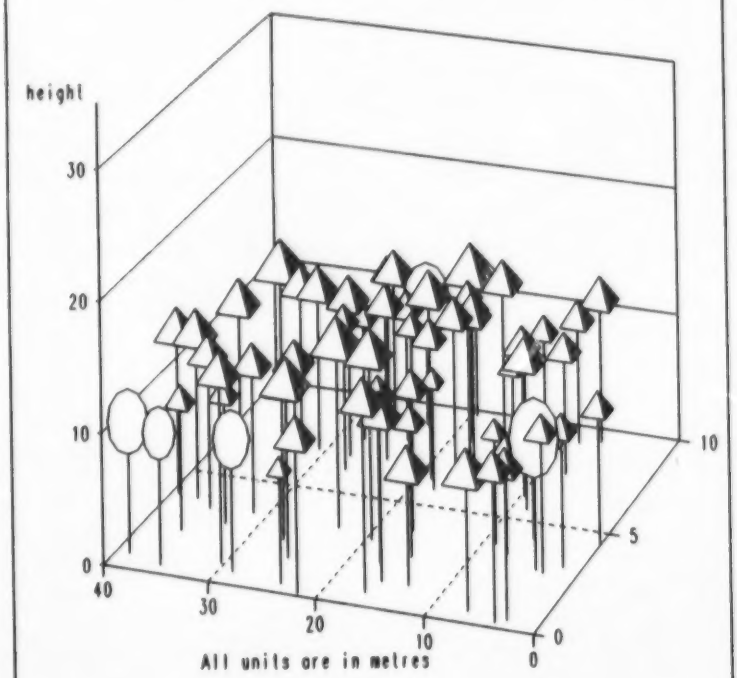
Hudson Bay

UTM: 13 67 583

An uneven-aged mixed stand of mostly white spruce, with a minor component of aspen-poplar, in the Mixedwood Section (B. 18a) of the Boreal Forest Region. The plot is flat and has an elevation of 1300 m. The average age of the trees was 43 years when the plot was established in 1986.

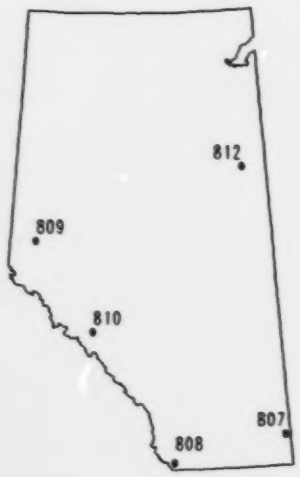
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=811 YEAR=1987



# PLOT NUMBER 812

ARNEWS PLOTS: ALBERTA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| balsam fir | 2 | 10.9 | 0.4 | 11.7 |
| white spruce | 37 | 19.7 | 30.8 | 18.4 |
| white birch | 1 | 17.2 | 0.5 | 15.5 |
| totals and averages: | 40 | 19.2 | 31.9 | 18.0 |

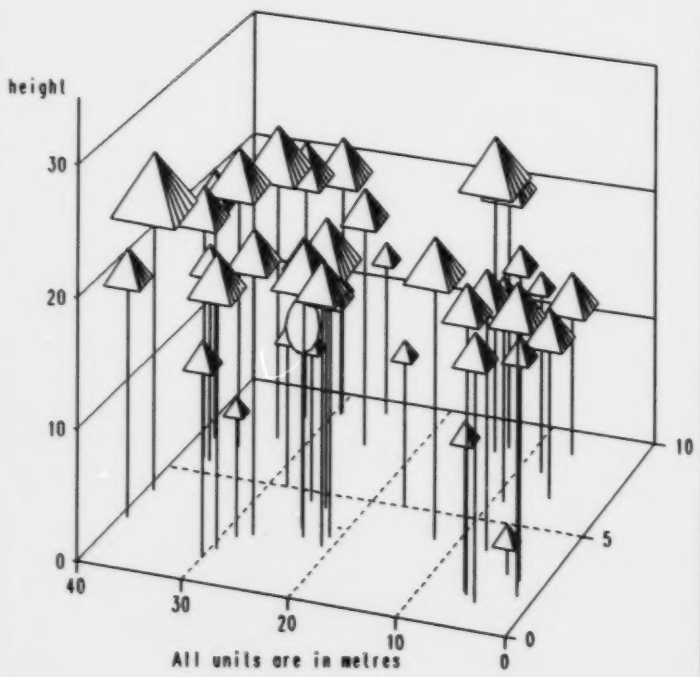
Gregoire Lake Provincial Park

UTM: 12 49 625

An even-aged mixed stand dominated by white spruce, with a minor component of balsam fir and birch, in the Mixedwood Section (B. 18a) of the Boreal Forest Region. The plot is flat and has an elevation of 510 m. The average age of the trees was 70 years when the plot was established in 1986.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=812 YEAR=1986



## Pacific Region ARNEWS Plots

*G.A. Van Sickle*

With the great variation in forest tree species, topography, and climate across British Columbia it was recognized that 15 plots, or even several times that, were not adequate to monitor the entire region for acid rain effects. Nonetheless the 15 plots now established do alert field and lab staff of FIDS to the possible symptoms. Moreover, with the extensive sampling and observations made each year, all regions of the province are examined. The actual plots were randomly located within stands that were: selected for long-term security from unnatural disturbance; representative of the major commercial tree species; middle-aged; and widely distributed, geographically and in terms of elevation. The emphasis was on areas judged to be at greatest risk from sources of regional air pollution.

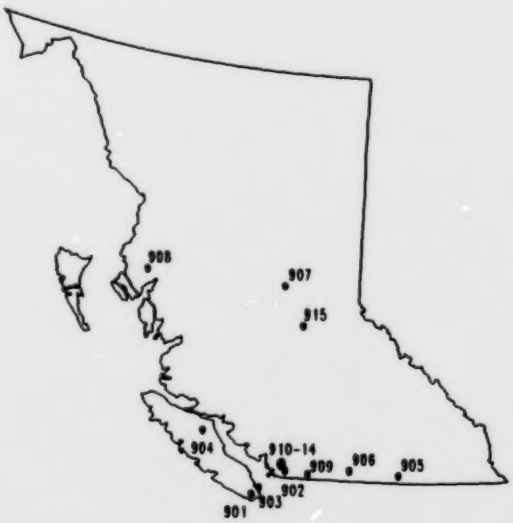
In 1984, the first year of the program, although only three plots were established, a major effort was made to identify other concerned agencies and related data sources such as weather records, precipitation chemistry, stream and lake monitoring, air quality monitoring, local point pollution sources, and long term soil and foliar analysis records. Contacts and cooperation were established with Forestry Canada and the Atmospheric Environmental Service, the B.C. Ministry of Environment, Canada Department of Oceans and Fisheries, the Greater Vancouver Regional District, and the University of British Columbia. As well, to the extent possible, plots were co-located to maximize usefulness of the varied data. During 1985 six more plots were established with an aim to extending coverage to interior and north-central B.C. In 1986 the last six plots were installed, largely downwind from the major populations centres of Vancouver and lower mainland.

In addition to plot establishment and annual monitoring according to national guidelines, two closely related regional studies were contracted out: the historical pattern of many chemical elements since 1971 was summarized (Feller 1986); and, because lichens are sensitive indicators of pollution, five selected ARNEWS plots were more closely inventoried for lichens and mosses (Palmer 1986). Photo plots were established, baseline chemical analyses obtained, and a few selected lichen transplants made into the plots.

The descriptions of the 15 Pacific Region ARNEWS plots follow.

# PLOT NUMBER 901

ARNEWS PLOTS: BRITISH COLUMBIA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| western white pine | 1 | 8.5 | 0.3 | N/A |
| Douglas-fir | 120 | 11.7 | 37.6 | 13.9 |
| willow | 9 | 6.4 | 0.7 | N/A |
| totals and averages: | 130 | 11.3 | 38.7 | 13.9 |
| standing dead trees: | 1 | | | |

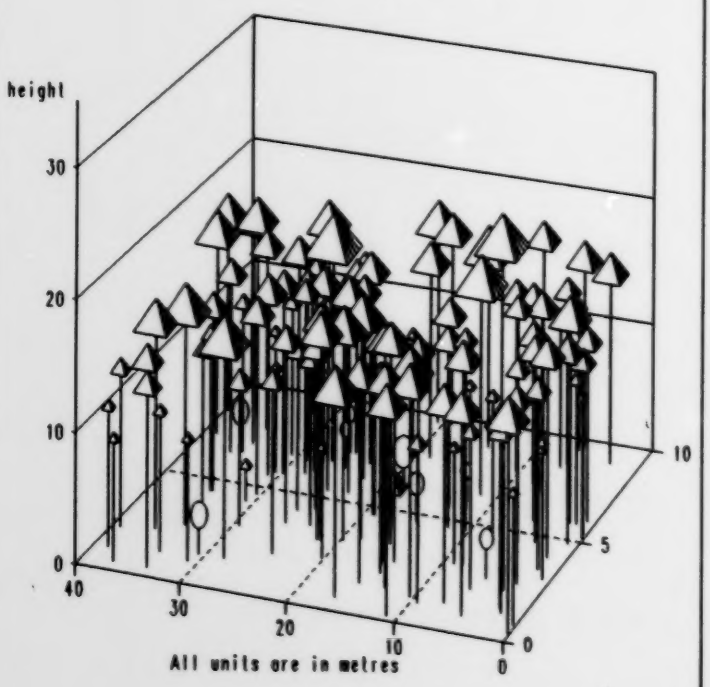
Shawnigan Lake

UTM: 10 44 538

Situated west of Shawnigan Lake on Vancouver Island in the Coastal Douglas-fir Biogeoclimatic Zone (CDFb), the plot is within a permanent research area established in 1970 to study the growth and biology of Douglas-fir ecosystems. It is at an elevation of 305 m in a high soil sensitivity zone. Average tree age was 33 years when the plot was established in 1984.

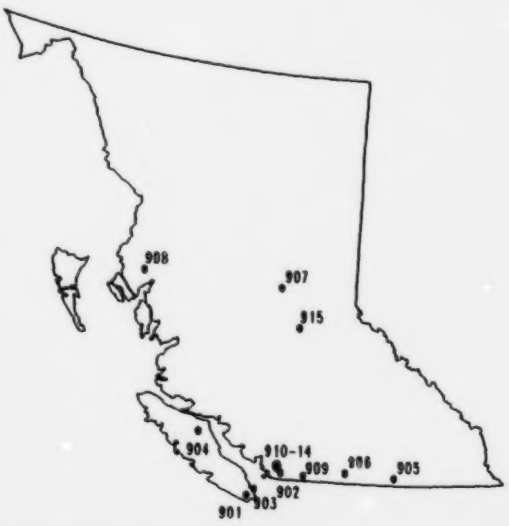
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=901 YEAR=1984



# PLOT NUMBER 902

ARNEWS PLOTS: BRITISH COLUMBIA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| western red cedar | 14 | 23.9 | 21.7 | 15.7 |
| western hemlock | 34 | 17.4 | 32.4 | 17.8 |
| birch | 2 | 19.3 | 1.5 | N/A |
| totals and averages: | 50 | 19.3 | 55.6 | 17.2 |
| standing dead trees: | 9 | | | |

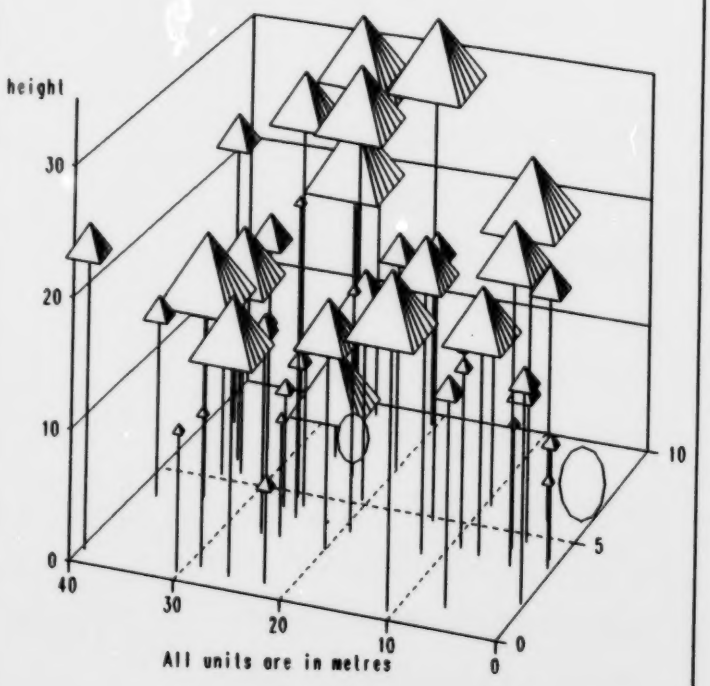
UBC Research Forest

UTM: 10 53 545

The plot is situated near Haney, east of Vancouver, in the UBC Research Forest, an experimental forest dedicated to research, education, and demonstration. It is at an elevation of 366 m in the Coastal Western Hemlock Biogeoclimatic Zone (CWHa). The average age of the trees was 44 years when the plot was established in 1984.

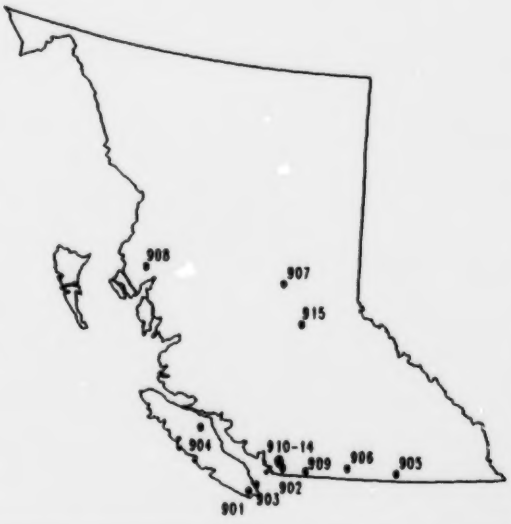
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=902 YEAR=1984



# PLOT NUMBER 903

ARNEWS PLOTS: BRITISH COLUMBIA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| Douglas-fir | 100 | 14.3 | 55.0 | 22.0 |
| western red cedar | 2 | 2.5 | 0.0 | N/A |
| totals and averages: | 102 | 14.1 | 55.1 | 22.0 |
| standing dead trees: | 2 | | | |

Saltspring Island

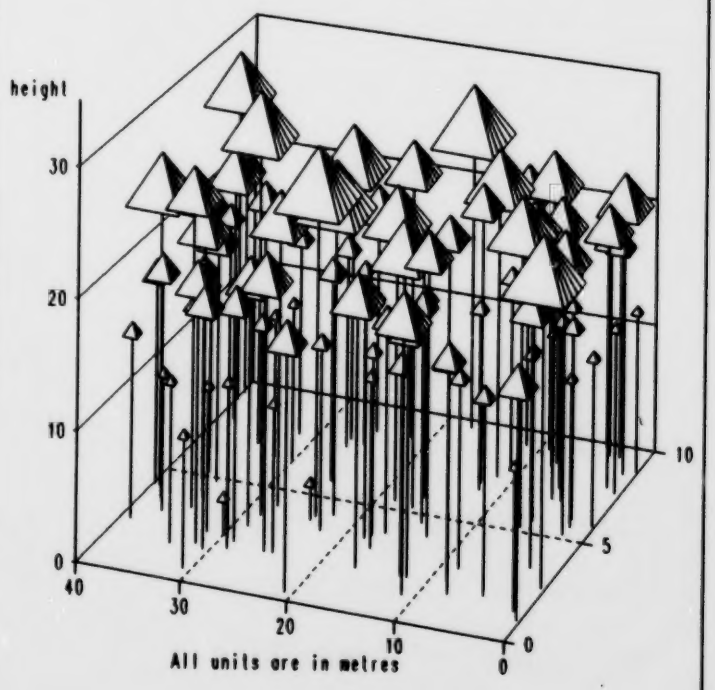
UTM: 10 46 540

Located on private land east of Lake Maxwell near Mount Maxwell Provincial Park on the western half of the island, the plot is at an elevation of 122 m in the Coastal Douglas-fir Biogeoclimatic Zone (CDFa).

The average tree age was 41 years when the plot was established in 1984.

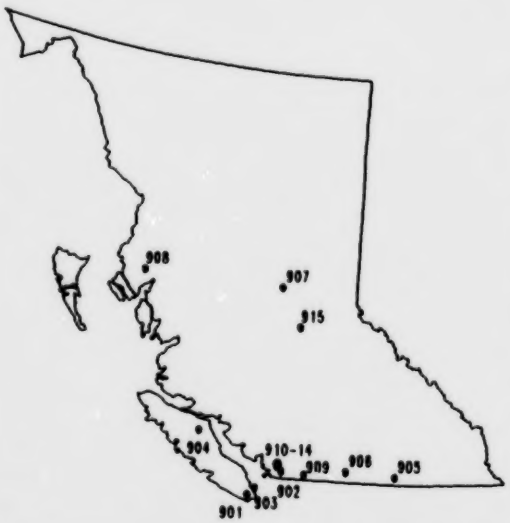
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=903 YEAR=1984



# PLOT NUMBER 904

ARNEWS PLOTS: BRITISH COLUMBIA




PLOT SPECIES CHARACTERISTICS

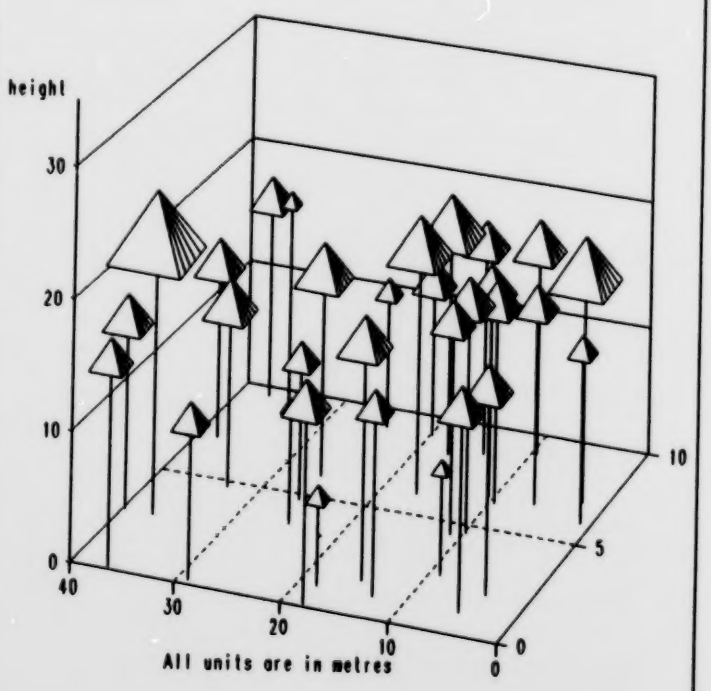
| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| amabilis fir | 1 | 8.5 | 0.1 | 17.0 |
| shore pine | 1 | 18.4 | 0.6 | 16.9 |
| Douglas-fir | 29 | 19.3 | 23.8 | 15.2 |
| totals and averages: | 31 | 19.0 | 24.6 | 15.3 |
| standing dead trees: | 0 | | | |

Campbell River

UTM: 10 32 554

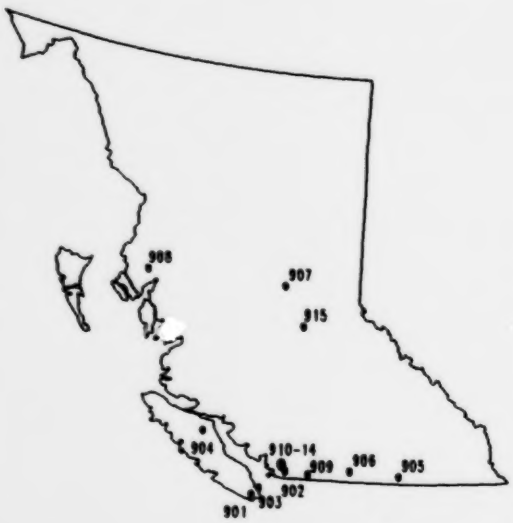
The plot is situated in a provincial forest productivity reserve near John Hart Lake, west of Campbell River on Vancouver Island. It is at an elevation of 150 m in the Coastal Douglas-fir Biogeoclimatic Zone (CDFb). The average of the trees was 34 years when the plot was established in 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=904 YEAR=1985



# PLOT NUMBER 905

ARNEWS PLOTS: BRITISH COLUMBIA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| alpine fir | 7 | 14.5 | 2.9 | 9.3 |
| Engelmann spruce | 34 | 14.8 | 15.6 | 9.4 |
| blue Douglas-fir | 1 | 16.4 | 0.5 | 6.0 |
| totals and averages: | 42 | 14.8 | 19.1 | 9.3 |
| standing dead trees: | 0 | | | |

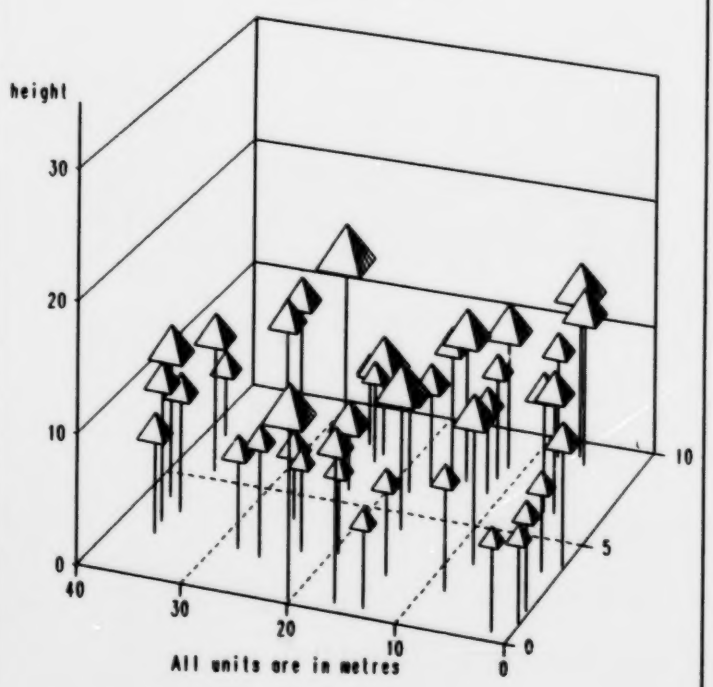
Castlegar

UTM: 11 42 545

The plot is located on provincial land on the Bulldog-Porcupine Forestry Development Road about 35 km west of Castlegar in the West Kootenay area of the Nelson Forest Region. It is at an elevation of 1545 m in the Interior Western Hemlock (IWH) Zone. Established in 1985.

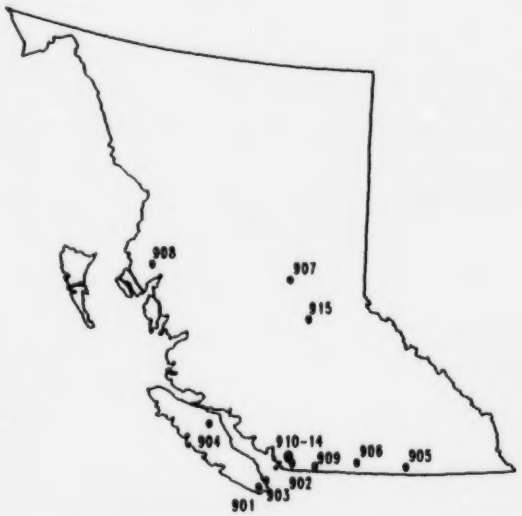
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=905 YEAR=1985



# PLOT NUMBER 906

ARNEWS PLOTS: BRITISH COLUMBIA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| blue Douglas-fir | 33 | 17.8 | 24.3 | 11.3 |
| totals and averages: | 33 | 17.8 | 24.3 | 11.3 |
| standing dead trees: | 0 | | | |

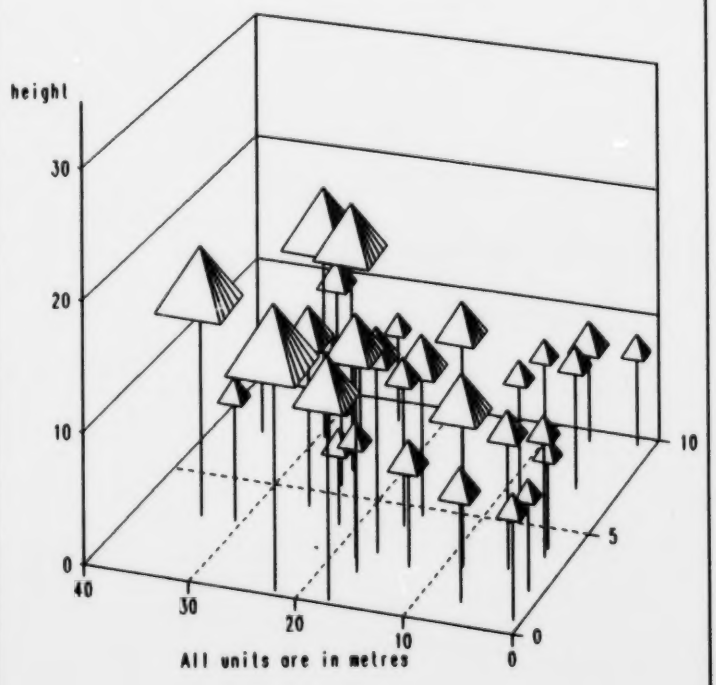
Penticton

UTM: 11 30 546

The plot is located on crown land near the Twin Lakes-Park Rill Creek access road west of Highway 97, between Keremeos and Penticton. It is in a stand of 70-year-old Interior Douglas-fir (IDF) on a poor, dry site at an elevation of 1300 m. The stand was selectively logged 20 to 40 years before the plot was established in 1985.

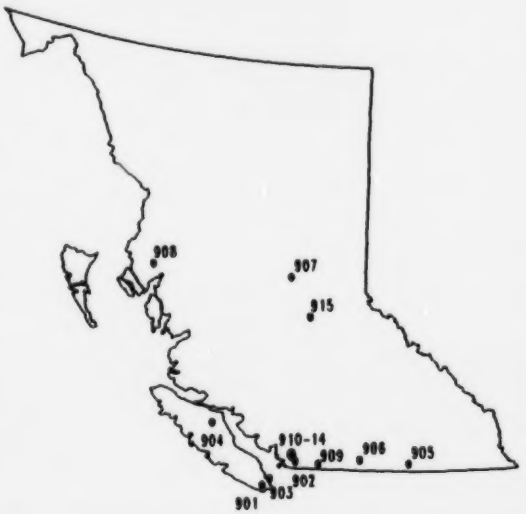
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=906 YEAR=1985



# PLOT NUMBER 907

ARNEWS PLOTS: BRITISH COLUMBIA




PLOT SPECIES CHARACTERISTICS

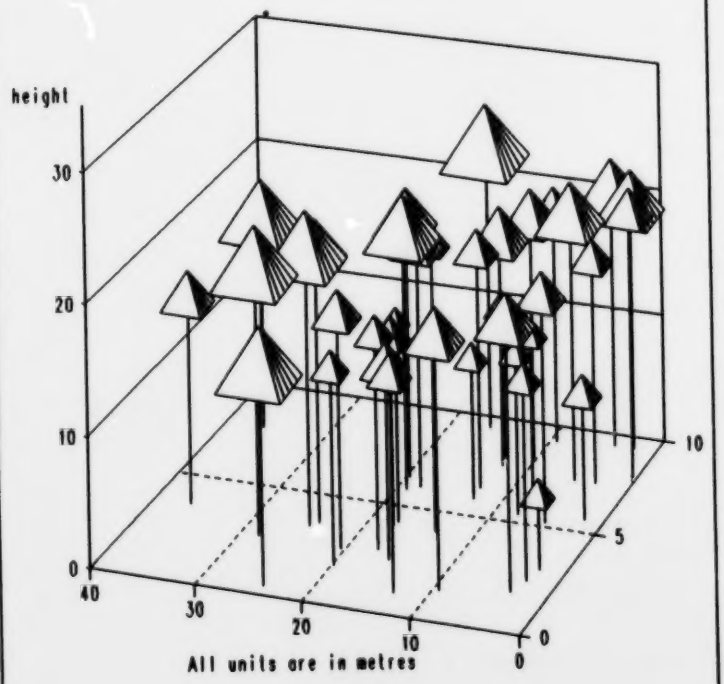
| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| alpine fir | 10 | 17.6 | 6.4 | 15.9 |
| white spruce | 25 | 23.2 | 28.9 | 18.2 |
| blue Douglas-fir | 3 | 24.3 | 3.8 | 17.5 |
| totals and averages: | 38 | 21.8 | 39.2 | 17.5 |
| standing dead trees: | 0 | | | |

Prince George

UTM: 10 48 601

The plot is situated about 70 km northeast of Prince George along the Averil Lake road east of Highway 97, off the North Fraser Road. It is at an elevation of 850 m in the Sub-Boreal Spruce Zone (SBSj). The average age of the trees was about 35 years when the plot was established in 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=907 YEAR=1985



# PLOT NUMBER 908

ARNEWS PLOTS: BRITISH COLUMBIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| Sitka spruce | 7 | 11.6 | 1.9 | 13.1 |
| lodgepole pine | 6 | 27.5 | 9.0 | 23.9 |
| western red cedar | 5 | 13.8 | 2.0 | 12.8 |
| western hemlock | 50 | 15.7 | 26.1 | 15.0 |
| totals and averages: | 68 | 16.2 | 39.1 | 15.5 |
| standing dead trees: | 1 | | | |

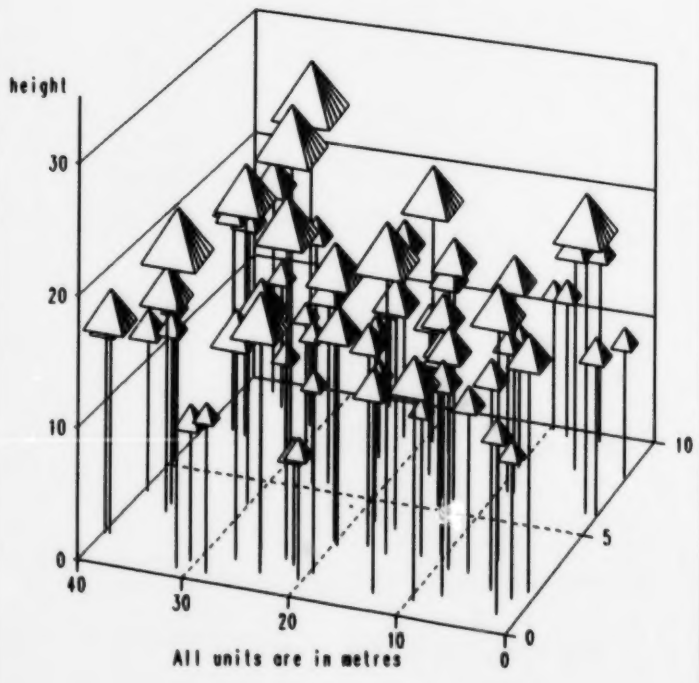
Terrace

UTM: 09 52 604

Situated about 7 km northeast of Terrace in the city's water catchment area between Spring and Deep creeks in the Prince Rupert Forest Region, the plot is at an elevation of 255 m in the Interior Western Hemlock Zone (IWH). The average tree age was 45 years when the plot was established in 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=908 YEAR=1985



# PLOT NUMBER 909

ARNEWS PLOTS: BRITISH COLUMBIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| Douglas-fir | 2 | 24.1 | 2.2 | 21.0 |
| western red cedar | 1 | 11.3 | 0.2 | 13.5 |
| western hemlock | 57 | 16.0 | 31.2 | 15.5 |
| totals and averages: | 60 | 16.2 | 33.7 | 15.6 |
| standing dead trees: | 3 | | | |

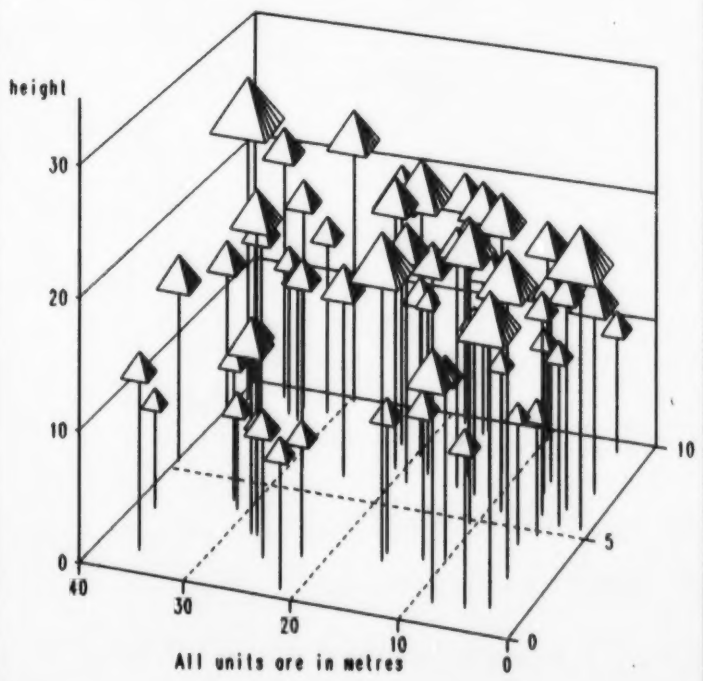
Chilliwack (Jones Lake)

UTM: 10 60 545

The plot is situated on crown land off the Wahleach Lake road between Cheam View and Laidlaw, about 6 km south of the Trans Canada Highway. It is at an elevation of 750 m in the Coastal Western Hemlock Zone (CWHb). The stand was logged 25 to 30 years ago. The average tree age was 29 years when the plot was established in 1985.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=909 YEAR=1985



# PLOT NUMBER 910

ARNEWS PLOTS: BRITISH COLUMBIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| amabilis fir | 58 | 18.2 | 43.9 | 13.7 |
| western red cedar | 1 | 13.1 | 0.3 | 6.1 |
| western hemlock | 16 | 18.0 | 11.3 | 14.4 |
| totals and averages: | 75 | 18.1 | 55.6 | 13.7 |
| standing dead trees: | 0 | | | |

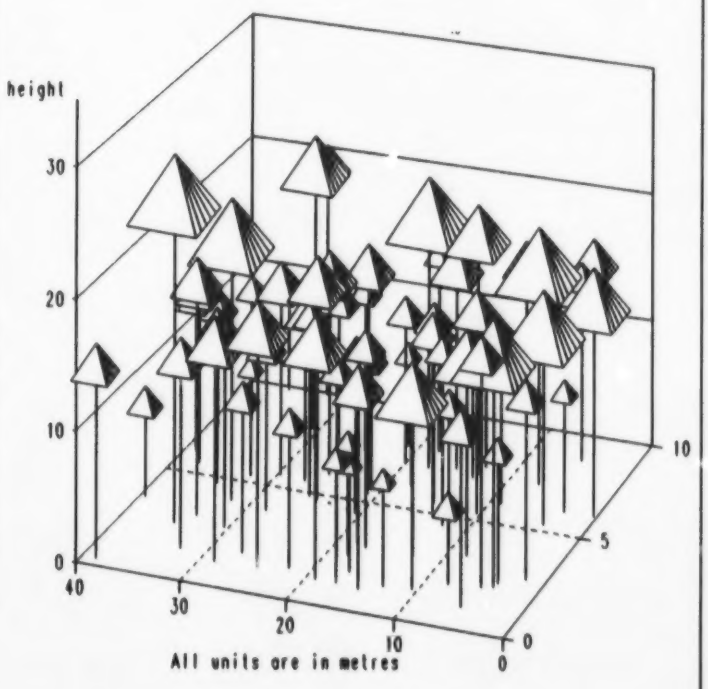
Capilano Watershed

UTM: 10 49 548

Situated about 19 km north of the dam in the restricted access Capilano River drainage north of Vancouver, the plot is on a very rich, wet site at an elevation of 100 m in the Coastal Western Hemlock Zone (CWHb). The average tree age was 29 years when the plot was established in 1986.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=910 YEAR=1986



# PLOT NUMBER 911

ARNEWS PLOTS: BRITISH COLUMBIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| Douglas-fir | 36 | 23.2 | 40.1 | 16.0 |
| western hemlock | 2 | 15.0 | 0.8 | 15.7 |
| totals and averages: | 38 | 22.8 | 40.9 | 16.0 |
| standing dead trees: | 2 | | | |

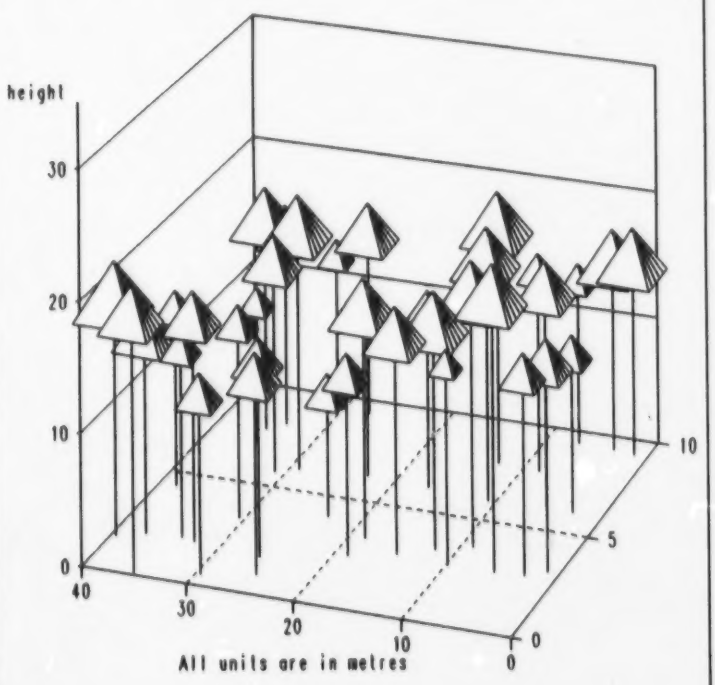
Seymour Watershed

UTM: 10 50 547

The plot, funded by Forestry Canada, is within the Seymour Demonstration Forest. (This demonstration forest is jointly funded with the B.C. Forest Service and the Greater Vancouver Regional District). It is at an elevation of 135 m in the Coastal Western Hemlock Zone (CWH) and was planted in 1964 following high lead clearcut logging. A precipitation and air quality monitoring station is nearby. Established in 1986.

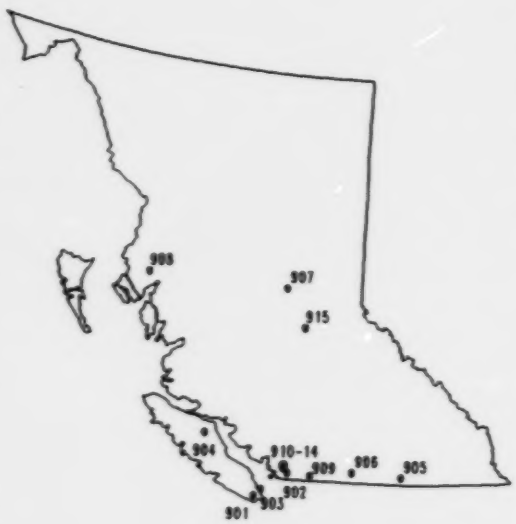
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=911 YEAR=1986



# PLOT NUMBER 912

ARNEWS PLOTS: BRITISH COLUMBIA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| amabilis fir | 5 | 18.4 | 3.7 | 9.9 |
| Douglas-fir | 25 | 16.4 | 14.2 | 10.5 |
| western hemlock | 22 | 14.5 | 9.4 | 9.6 |
| totals and averages: | 52 | 15.8 | 27.4 | 10.1 |
| standing dead trees: | 0 | | | |

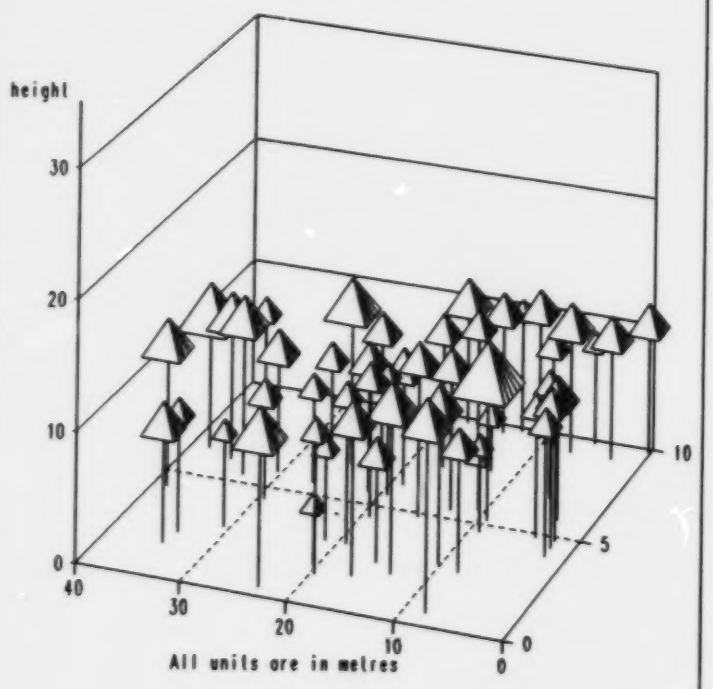
Seymour Watershed

UTM: 10 50 548

The plot is located 22.5 km north of the main entrance to the Seymour Watershed. It is at an elevation of 275 m in the Coastal Western Hemlock Zone (CWH). The average tree age was 13 years when the plot was established in 1986.

DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=912 YEAR=1986



# PLOT NUMBER 913

ARNEWS PLOTS: BRITISH COLUMBIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| amabilis fir | 5 | 18.8 | 3.5 | 17.6 |
| western red cedar | 20 | 16.2 | 11.2 | 13.7 |
| western hemlock | 46 | 14.8 | 22.1 | 16.2 |
| totals and averages: | 71 | 15.5 | 36.8 | 15.6 |
| standing dead trees: | 0 | | | |

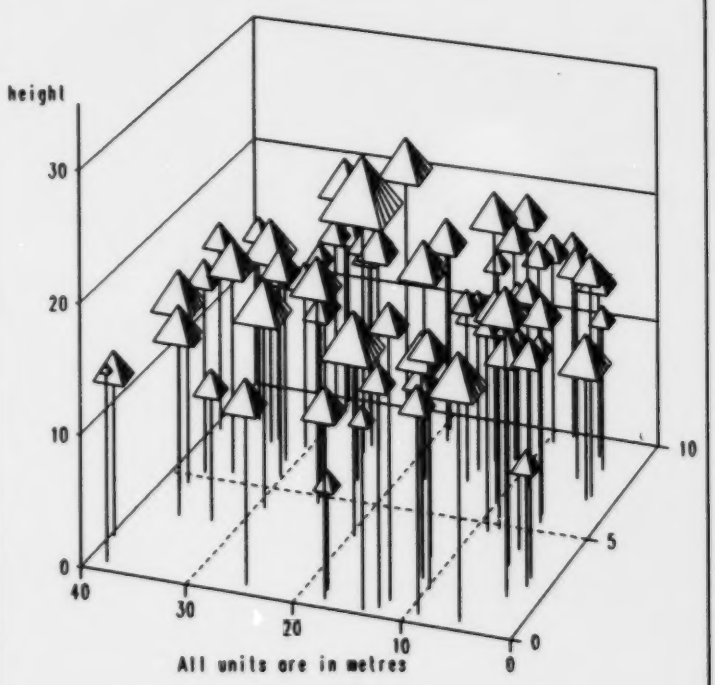
Coquitlam Watershed

UTM: 10 51 546

The plot is situated 6.5 km north of the main entrance to the Coquitlam Watershed (GVRD), and east of Coquitlam Lake off branch road 110. It is at an elevation of 495 m in the Coastal Western Hemlock Zone (CWHb). The average tree age was 35 years when the plot was established in 1986.

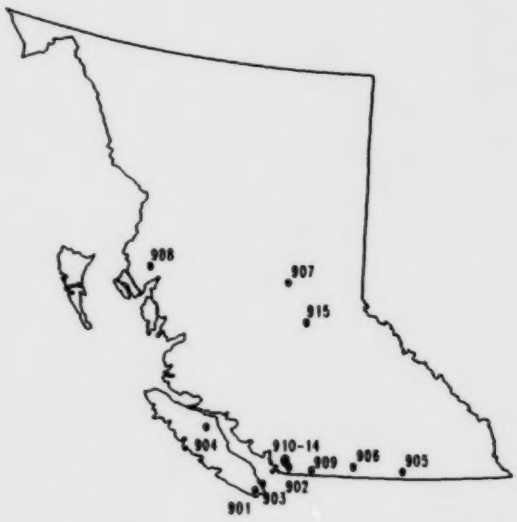
DIAGRAM OF PLOT AT FIRST MEASUREMENT

PLOT NUMBER=913 YEAR=1986



# PLOT NUMBER 914

ARNEWS PLOTS: BRITISH COLUMBIA




PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| amabilis fir | 36 | 13.8 | 13.8 | 10.9 |
| western hemlock | 29 | 14.7 | 13.8 | 12.6 |
| totals and averages: | 65 | 14.2 | 27.7 | 11.6 |
| standing dead trees: | 0 | | | |

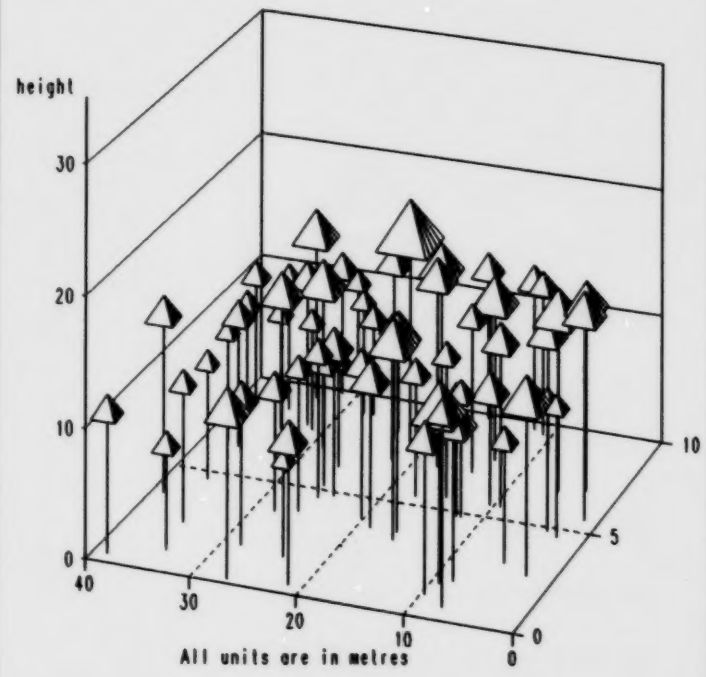
Coquitlam Watershed

UTM: 10 51 546

Situated west of Coquitlam Lake, about 5 km west of plot 913 in the Coquitlam Watershed (GVRD), the plot is at an elevation of 165 m in the Coastal Western Hemlock Zone (CWHb).

The average tree age was 32 years when the plot was established in 1986.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=914 YEAR=1986



# PLOT NUMBER 915

ARNEWS PLOTS: BRITISH COLUMBIA

PLOT SPECIES CHARACTERISTICS

| SPECIES | number of trees on plot | mean dbh (cm) | basal area (m2/ha) | mean height (m) |
|---|---|---|---|---|
| alpine fir | 2 | 13.6 | 0.7 | 14.4 |
| white spruce | 33 | 17.6 | 21.6 | 16.6 |
| lodgepole pine | 10 | 32.5 | 21.8 | 18.8 |
| totals and averages: | 45 | 20.7 | 44.8 | 17.0 |
| standing dead trees: | 0 | | | |

Quesnel

UTM: 10 55 584

The plot is located on crown land about 33 km northeast of Quesnel and 1 km north of Cottonwood House Historic Park on Highway 26 in the Cariboo Forest Region. It is at an elevation of 850 m in the Sub-Boreal Spruce Zone. The pine averaged 107-years-old and the spruce 74-years-old when the plot was established in 1986.

DIAGRAM OF PLOT AT FIRST MEASUREMENT
PLOT NUMBER=915 YEAR=1986